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Tibet's Ancient Tradition of Sky Burial

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THE BLOOD COUNTESS: Serial Killer or Victim?

Gods & Beasts of the Underworld

+10 Must-Visit Places in Cappadocia

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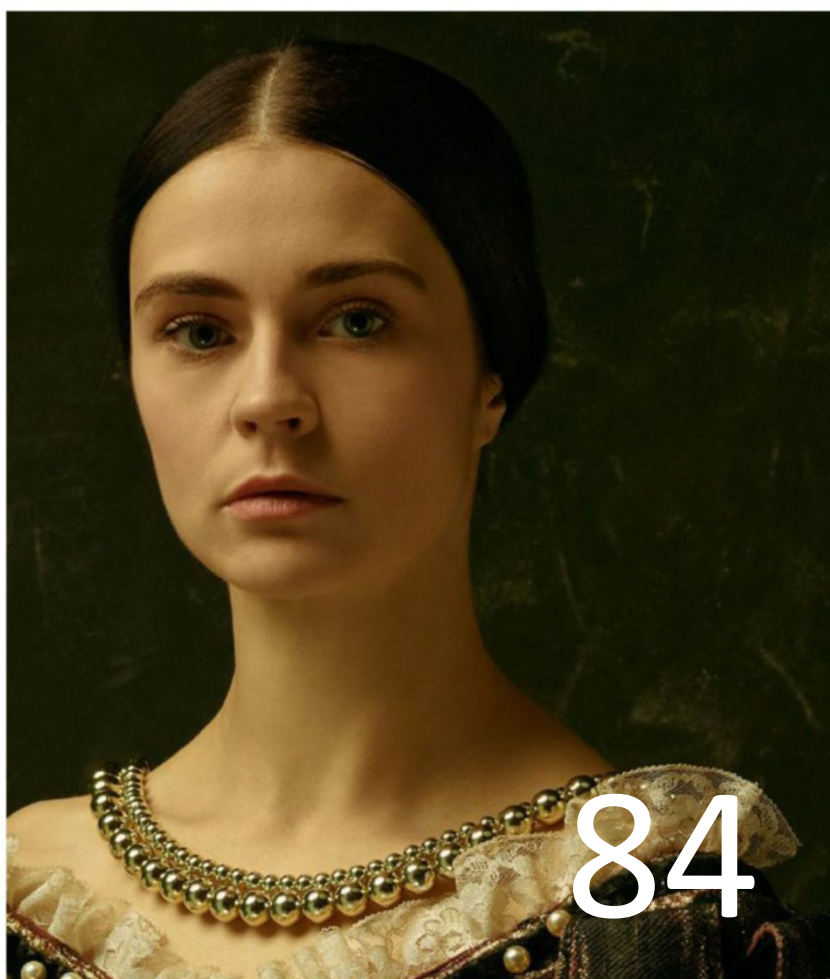
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Spotlight: UNDERWORLD

EVERY corner of the Earth has now been mapped, photographed, measured, and scanned and—courtesy of Google—we can explore every inch of it, from the streets of Rome to the jungles of Guatemala. But beneath our feet is a world that remains largely unseen. Google's cameras have yet to reach the subterranean world – the endless tunnels, caves, caverns, and even cities! Perhaps that's what makes 'the underworld' so captivating. It's a little slice of our planet that remains hidden, silent, and mysterious. Caves have always held an attraction for humans. They have witnessed our evolution, serving as shelters, homes, refuges, and strongholds. But beyond physical need, those dark and silent spaces have served as a gateway to the 'otherworld'. In ancient legend and mythology, they are places where the dead cross to the afterlife, and where gods and beasts dwell.

In this issue, we visit the place where humankind first left their mark – Sterkfontein caves in South Africa – where over two million years ago, individuals from five species of pre-humans ventured underground, but never escaped alive. We dig into the world beneath Mexico's City of the Gods, the vast labyrinth of caves and tunnels that extend below the great site of Teotihuacan. We examine the land of subterranean cities – Cappadocia, in Turkey – where for thousands of years, people carved out their lives; tombs, temples, and towns

deep below the surface. And we delve into one of the most enigmatic cave systems in the Americas – Cueva de Los Tayos in Ecuador – with a first-hand account of Ancient Origins' own expedition into this intriguing and, at times, dangerous network of caves.

We escort you through the deepest realms, journeying to the underworld, populated by gods, beasts, and characters of ancient legend; from guardians of hell in Greek, Norse, Hindu and Chinese mythology, to gods of justice, and demons of death. From the deepest chasms, we soar to the highest mountains, turning to Tibet where a very unique form of funerary rite takes place – sky burial. In these high-altitude ceremonies, human corpses are offered to vultures as a final, honorable service to nature.

Dr. Eran Elhaik, geneticist and expert on paleogenomics, has made world history by developing the first DNA test to compare modern-day people's DNA to that of ancient people who lived thousands of years ago. Will you soon discover that you are related to a Roman gladiator...or a famous Egyptian Pharaoh? Speaking of fame, the infamous Elizabeth Bathory was a 16th-century countess recorded as one of the most prolific serial killers in history. But was she instead the victim of political betrayal? You be the judge! ■



Joanna Gillan

Chief Editor, Ancient Origins Magazine

EXPERTS IN THIS ISSUE...



Dr. Eran Elhaik

Dr. Eran Elhaik completed a Ph.D. in Molecular Evolution and two post-docs working on population genetics and mental disorders. Dr. Elhaik is currently a lecturer in the Bioinformatics Hub of the University of Sheffield focusing on population genetics.



Marco M. Vigato

Marco M. Vigato, a native of Italy, who lives in Mexico City is dedicated to documenting the evidence of ancient advanced civilizations and sacred sites around the world. Much of his recent research has focused on the megalithic remains of ancient Mexico and Mesoamerica.



Martini Fisher

Martini Fisher is a mythographer and author who gathers myths and legends from around the globe to present them in a relevant and approachable way for modern audiences.

HISTORY

We inherit it, we make it,
and we are destined to
become part of it



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Archaeonews

BY JOANNA GILLAN

Hundreds of Egyptian Mummies

An enormous cache of human mummies provisionally dated to a period from the 6th century BC to the first century AD was found in Egypt near one of the world's oldest pyramids.

Polish archaeologists from the University of Warsaw's Faculty of Oriental Studies were working in the Saqqara necropolis near the 4,700-year-old Djoser step pyramid, close to the ancient capital of Memphis in Lower Egypt, when they came across hundreds of mummies.

The mummies had been buried with only modest arrangements in wooden coffins and while some of them had a symbol of the Blue Anubis, protector of graves, on their base, there is none of the ornamentation and decorations that are associated with the burials of nobles, bureaucrats, and Pharaohs.

The fragmentary remains of the caskets indicate that they were not very well made. The mummies had only been embalmed in a very basic way and wrapped in bandages before being deposited in graves dug into the sand. This suggests that those buried at the site came from lower down in the social hierarchy, perhaps everyday citizens from Memphis.

The mummified cadavers were found in a location between the ancient step-pyramid and the so-called "dry moat", a deep ditch surrounding the pyramid's sacred area. In ancient Egyptian beliefs, the dry moat (trench) was a type of symbolic path or structure that the pharaoh had to traverse on his route to immortal life. Some of the burials were found in this symbolic moat.



Researchers found hundreds of mummies near the 4,700-year-old Djoser step pyramid.

66-Million-Year-Old Dinosaur Eggs

A 10-year-old boy in China who was out playing near a lake accidentally unearthed a fossilized egg that led to the discovery of a very rare dinosaur nest that is 66 million years old. The find is just the latest in a city that has become famed for its number of dinosaur finds, especially fossilized eggs.

The discovery was made in the city of Héyuán, in the province of Guangdong. Zhang Yangzhe was trying to find something that could crack open walnuts on an embankment near the Dong River when he found a "strange stone" about four inches in diameter. Based on its shape, the boy suspected that it was a dinosaur egg and called over his mother, Li Xiaofang, to have a look. She immediately contacted the local museum about the find and they both stood guard over the site until experts arrived on the scene and secured it.

Experts confirmed that the strange stone was a fossilized egg. In the following days, they began to excavate the site where Zhang had made his discovery. During the dig, they found 10 more eggs that were identical to the one discovered by the schoolboy. They determined that Zhang had found a dinosaur nest because they were all unearthed in a small area.

Huang Ding, who formerly was a director at the local Héyuán Museum, stated that the fossils came from the late Cretaceous period. This was the era just prior to the mass extinction of the dinosaurs, about 65 million years ago.

Oldest Human Skull Outside Africa

Scientists carried out new analyses of two cranial fossils found in Apidima Cave along the southwestern coast of the Peloponnese in Greece in the 1970s. Both were initially identified as Neanderthals and filed away as finds that were interesting but relatively unsurprising.

However, the new analyses found that one of the fossils did not belong to a Neanderthal but instead was a 210,000-year-old human skull – the oldest *Homo sapiens* specimen ever found outside Africa by more than 50,000 years.

The multinational research team led by Katerina Harvati reconstructed the specimens digitally, which revealed anatomical features that are characteristic of *Homo sapiens*. They dated them by measuring their radioactive decay.

The discovery adds to a list of recent fossil discoveries. Improvements in dating and genetic evidence shows that the story of humanity's spread across the world and interaction with other related species is much more complicated than once believed.

The skull from Greece provides new evidence that our species left Africa much earlier than previously thought. ■



A model of a dinosaur nest.

SKY BURIAL

TIBET'S ANCIENT TRADITION FOR HONORING THE DEAD

BY MARINA SOHMA

A SKY burial is the act of leaving a corpse, cut into precise pieces by a burial master, exposed to the elements of nature. This master would also be in charge of smashing and grinding the bones of the deceased body, and then leaving the prepared corpse out in their selected open site. This was a way of providing a final honorable service to their material body; sending it back to the earth and serving as an offering of a meal to the vultures.

The tradition of sky burials (or 'celestial burials'), is particularly associated with the Tibetan culture, although it has existed in other civilizations throughout history. It might sound like an alarming concept for people living in our current society, but its values and philosophy are surprisingly beautiful and virtuous. Choosing a humble path and honoring nature by feeding their local vultures, some people from the Tibetan culture have preferred to be given a sky burial

ceremony to terminate the existence of their physical bodies. The Tibetans believe that there is a great honor in knowing that the body will go back to nature, and nourish some of nature's creatures, in this case, the bearded vultures or 'Dakinis' (meaning 'sky dancers'), which is the Tibetan equivalent of angels.

Sky burials often take place at high elevation locations since the vultures are the desired creature to be fed. In addition, the physical location plays an important part in this selection of burial since there would be very little ground space that could be used as cemetery, and the ground would often be frozen, making it difficult to dig. This has therefore been the most common way of disposing of dead bodies in Tibet.



According to data from Tibet's Department of Civil Affairs, there are 1,093 burial masters working in the country. The role of a burial master is a full-time profession, usually adopted by monks appointed by masters from Buddhist schools.

VULTURES OR 'DAKINIS'
(MEANING 'SKY DANCERS'),
ARE THE TIBETAN
EQUIVALENT OF ANGELS



VULTURES AWAIT THEIR MEAL
AT A SKY BURIAL CEREMONY
IN YARCHEN GAR VILLAGE, IN
SICHUAN PROVINCE, CHINA





THE TIBETAN BELIEF

According to Tibetan beliefs regarding burials and death, which is based on the Buddhist belief of reincarnation and transmigration, the soul leaves the body at the moment of death.

Tibetan people are not afraid of death because it is viewed as a transformation and not an ending, and, therefore, Tibetans face the idea of death with serenity and calmness. They believe that in order to have a smooth transmigration a person should leave no trace of their earthly existence, which includes their physical body.

It is a sign of bad luck, or of one's sins, if the vultures do not devour the offered corpse because it means that it is too dirty to be eaten. The other explanation for such an outcome is that the family of the deceased did not perform all the required religious funerary rites. In those cases, other animals, such as wild dogs, would be brought in to eat the corpse.

THE PROCESS AND PREPARATION OF THE BODY

When a person dies, their bodies are wrapped in white cloth and placed in a corner of the house for a period of three to five days. During this time monks or lamas read scriptures aloud so that the soul can be released from purgatory. The home environment is supposed to be kept peaceful to allow a smooth passing and ascension of the soul to the heavens. All family members discontinue any other activities in order to take care of this process. When the prayer period is over, the family members pick a day for the corpse to be taken to the sky burial site.

According to Pamela Logan, "Tibetans believe that, more important than the body, is the spirit of the deceased. Following death, the body should not be touched for three days, except possibly at the crown of the head, through which the consciousness, or *namshe*, exits. Lamas guide the spirit in a series of prayers that last for seven weeks, as



Left: Corpse being carried from Lhasa for sky burial. The corpse is sewn into a yak hair cloth and two white silk Khata as offerings. Circa 1920.

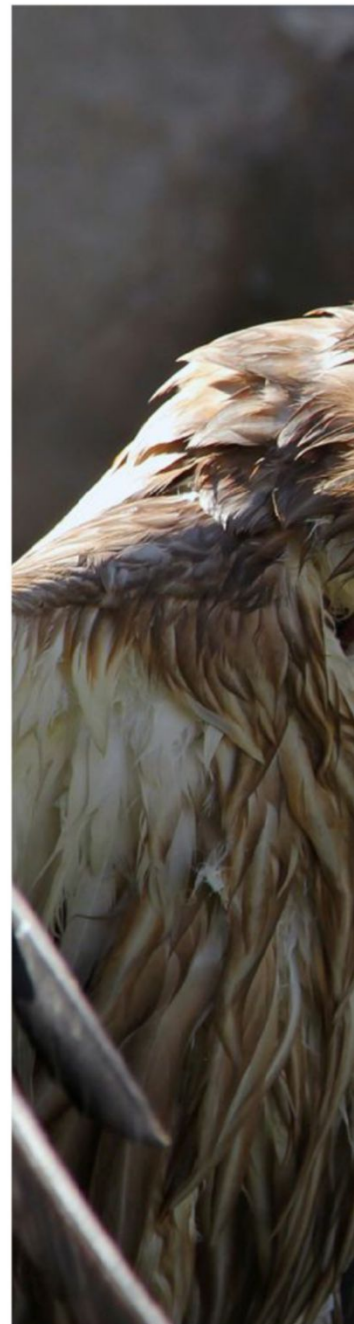
Opposite: Vultures help to 'clean' human skeletal remains.

the person makes their way through the *bardo*—intermediate states that precede rebirth”.

The Dakinis supposedly take the soul to the heavens, to a windy location, where the soul waits for its next reincarnation. Besides holding the belief of generosity towards feeding these sacred birds, Tibetans also say that this choice of disposing of the body honors and spares the life of other animals which would have been eaten by the vultures.

Although sky burials are believed to have existed for over 11,000 years, as evidence from excavations at Göbekli Tepe in Southern Turkey indicates, Daniel Martin, author and researcher of sky burials, believes that we lack accurate records to validate such arguments. Regarding the practice of sky burials in Tibet, there is very little evidence to determine when it began. The earliest source which we currently have is an inaccurate account, dating from the 14th century, from a European traveler named Friar Odoric (1286-1331).

“Because of the nature of the practice, archaeological finds are probably incapable of providing evidence. Early Tibetan works from the Imperial Period and the period from 1000 to 1500 CE have, so far as we have been able to discover, nothing to say on the practice, since they only describe the interments of saints and kings, not of common people. It is entirely possible that more research, especially in Tibetan language sources, will reveal a much earlier verifiable date for the custom”, Daniel Martin explains. ■





DEATH TOURISM

In recent times, a grotesque trend has seen tourists flocking to sacred sky burial ceremonies with cameras in hand to take selfies with vultures descending on corpses in the background. They Tweet and Instagram images of the birds with torn pieces of human flesh in their beaks, or upload videos of the sacred rites to YouTube. In some instances, tourism has been actively encouraged. At the sky burial site near the Larung Gar Buddhist Institute near Sertar, Sichuan, the Chinese have built a "Temple of Death" to attract and entertain the growing numbers of Chinese tourists. However, in most cases, visits by tourists with morbid curiosities have been frowned upon and caused upset among those carrying out the ceremony or fare-welling a loved one. In 2015, Tibet passed a law protecting its sacred sky burials for the first time.



CHARLES CHRISTIAN'S

Ritual Year



Feasting at Lughnasadh

IN the Northern Hemisphere, August 1 is now indelibly associated with the festival of Lughnasadh (also spelled Lugnasa and pronounced *loo-nas-ah*). It is one of the four key seasonal festivals of the traditional Celtic/Gaelic year (the other three are Samhain/Halloween, Imbolc/Candlemas and Beltane/May Day). And it is one of the eight festivals of the Neo-Pagan/Wiccan 'Wheel of the Year'. Confusingly, it also coincides with the ancient Christian festival of Lammas – so what is the story?

As with many of these 'traditional' festivals dating back until time immemorial, it is often hard to distill the historical facts from the later romantic 'Celtic reconstructionist' ideas of the 19th and 20th centuries. For example, one theory holds that Lughnasadh is derived from the pre-Christian Celtic god Lugh. But none of the dedications to pagan gods in the former 'Celtic' provinces of the Roman Empire (including Britannia, Gaul, and Germania) make any mention of a god called Lugh. In fact, Lugh only emerges as a deity in early medieval Irish literature – and even then he is not a god of the harvest or the sun. It is therefore quite likely Lughnasadh has nothing whatsoever to do with the god Lugh and may actually derive from an old Irish name for August. What we do know is that from the medieval period onwards, August 1 was the occasion for festivities celebrating 'first fruits' (or the first harvest festival of the year) in Ireland, Scotland, and the Isle of Man – the old Gaelic-speaking parts of the British Isles. That said, the first written records

chronicling Lughnasadh festivities only date from as recently as the 15th century, leaving a very large gap between then and pre-Christian times.

What we also know is that in England, from as early as the seventh century, the Anglo-Saxons were celebrating 'the feast of first fruits' on August 1 – and indeed by the ninth century, it was known as *hlaef-mass* or Loaf Mass, which later became Lammas.

Cutting through the myth-making, the historical significance of August 1 is that it was the start of the annual harvest season in Europe (the date lying mid-way between the summer solstice and the autumn equinox), a time when the first new grains were available to replenish stocks and bake fresh bread, and a time when trees and bushes were yielding the first of the autumnal berries and fruits.

Given the success or failure of a harvest in medieval times, when people lived in an agrarian society, meant the difference between life and death from starvation, it is understandable our ancestors chose to celebrate this occasion when the 'first fruits' appeared. In fact, it was also known as the 'Gule of August' –

the Feast of August – as it was the first occasion for a communal feast after the lean times of the late spring and early summer when food stocks harvested the previous year would be rapidly diminishing.

So yes, by all means, celebrate Lughnasadh as part of your Wiccan or Neo-Pagan beliefs, or Lammas as a Christian tradition – as long as you remember the origins were not so much mystical as practical: as a festival of thanksgiving celebrating the arrival of fresh food stocks to see the community through another winter. ■



Charles Christian is a barrister and Reuters correspondent turned writer, award-winning tech journalist, radio presenter, podcaster, blogger, storyteller, and sometime werewolf-hunter who presents a weekly podcast: [the Weird Tales Radio Show](#).

THE ANCIENT CHINESE SWORD THAT DEFIED TIME

BY BRYAN HILLIARD



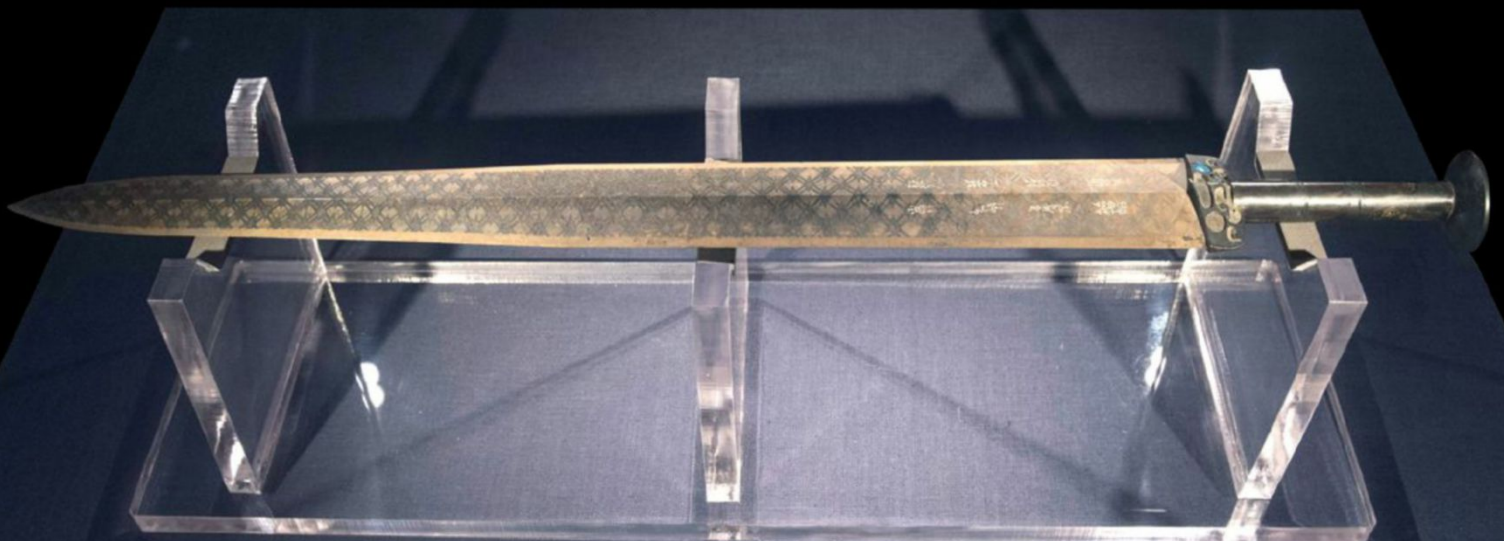
IN 1965, archaeologists were carrying out a survey in Hubei province, China, four miles from the ruins of Jinan, capital of the ancient Chu state, when they discovered 50 ancient tombs. Inside one of the tombs, sealed in a near air-tight wooden box next to a skeleton, they found a rare and perfectly preserved bronze sword with a scabbard. When it was unsheathed, the blade did not have a single trace of rust, and it drew blood when an archaeologist tested his finger on its edge; it was seemingly unaffected by the passage of time.

The precious weapon – which has come to be known as the Sword of Goujian after its former owner, the famous emperor Goujian (496 – 465 BC) – is one of the earliest known Jian swords, a double-edged straight sword which was among the first sword types in China. The Goujian is a bronze sword

with a high concentration of copper, making it more pliant and less likely to shatter. The fine edges are made of tin, making them harder and capable of retaining a sharper edge. The grip was bound by silk while the pommel is composed of 11 concentric metal circles. Two columns of text are visible with eight characters etched into the blade. Six of the eight characters have been deciphered and read: “King of Yue made this sword for his personal use”.

Analyses of the sword revealed that the blade is resistant to oxidation as a result of sulphation on the surface of the sword. This, combined with an air-tight scabbard, allowed the legendary sword to be found in such pristine condition.

Regarded as a state treasure in China today, the sword is as legendary to the Chinese people as King Arthur's Excalibur in the west. ■



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Masonic Well

The Sintra Mountains in Portugal form a backdrop to once lavish villas and palaces occupied by royalty and peerage. One of these is Quinta da Regaleira, a spectacular estate that has been transformed into a tangible monument to the symbolism of the Freemasons, Knights Templar, and the Rosicrucians by its owner António Augusto Carvalho Monteiro. The estate grounds feature lakes, grottoes, fountains, and an enigmatic system of tunnels that connect two spiraling wells. The smaller well contains staircases, connecting the ring-shaped floors. It is believed that the spacing of the landings and the number of steps in between were dictated by Masonic principles. At the bottom of the well there is a compass over a Knights Templar cross, which was Monteiro's herald and a sign of his Rosicrucianism. These wells were not used for water, but perhaps for initiation rites.

SeanPavonePhoto | AdobeStock

spotlight



CAPPADOCIA

THE LAND OF SUBTERRANEAN CITIES, FAIRY CHIMNEYS, AND CAVE DWELLINGS

BY DR. MICKI PISTORIUS

THE region of Cappadocia in central Turkey is home to one of the most spectacular landscapes in the world. Over three million years ago, a volcanic eruption deposited a veil of ash across the 1,500 square mile landscape which formed into a soft rock. Wind and water erosion transformed the rock and the people of the region continued this process by carving their homes, chapels, tombs, temples, and entire subterranean cities from the natural landforms. Through the ages, the Hittites, Persians, Alexander the Great, Rome, the Byzantine Empire, Ottoman Empire, and Turkey have all governed this incredible region.

Cappadocia covers the cities of Nevşehir, Ürgüp, and Avanos, the sites of Karain, Karlık, Yeşilöz, Soğanlı, and the subterranean cities such as Kaymaklı and Derinkuyu. One hundred square miles with more than 200 underground villages and a remarkably storied history of each new civilization building on the foundations of the last, make Cappadocia one of the world's most striking and largest cave-dwelling regions of the world. Cities, empires, and religions have risen and fallen around these unique underground havens—yet they remain occupied to this day.

More than 40 complete underground cities and 200 underground structures have been discovered in the Cappadocia region, many of them connected to each other via tunnels. The earliest origins of these underground cities are unknown. Some archaeologists speculate they were built by the Hittites (circa 1200 BC), when the region was known as the Hatti. Others date them back even further to a time predating metal, for it is believed the tunnels were hewn using stone, as opposed to metallic tools. It is known that most of the levels were dug out by early Christians to provide them with refuge from persecution — first during Roman times, and later from invading Arabs during the Arab–Byzantine wars (780–1180 AD) and again in the 14th century during the Mongolian invasions.

DERINKUYU UNDERGROUND CITY

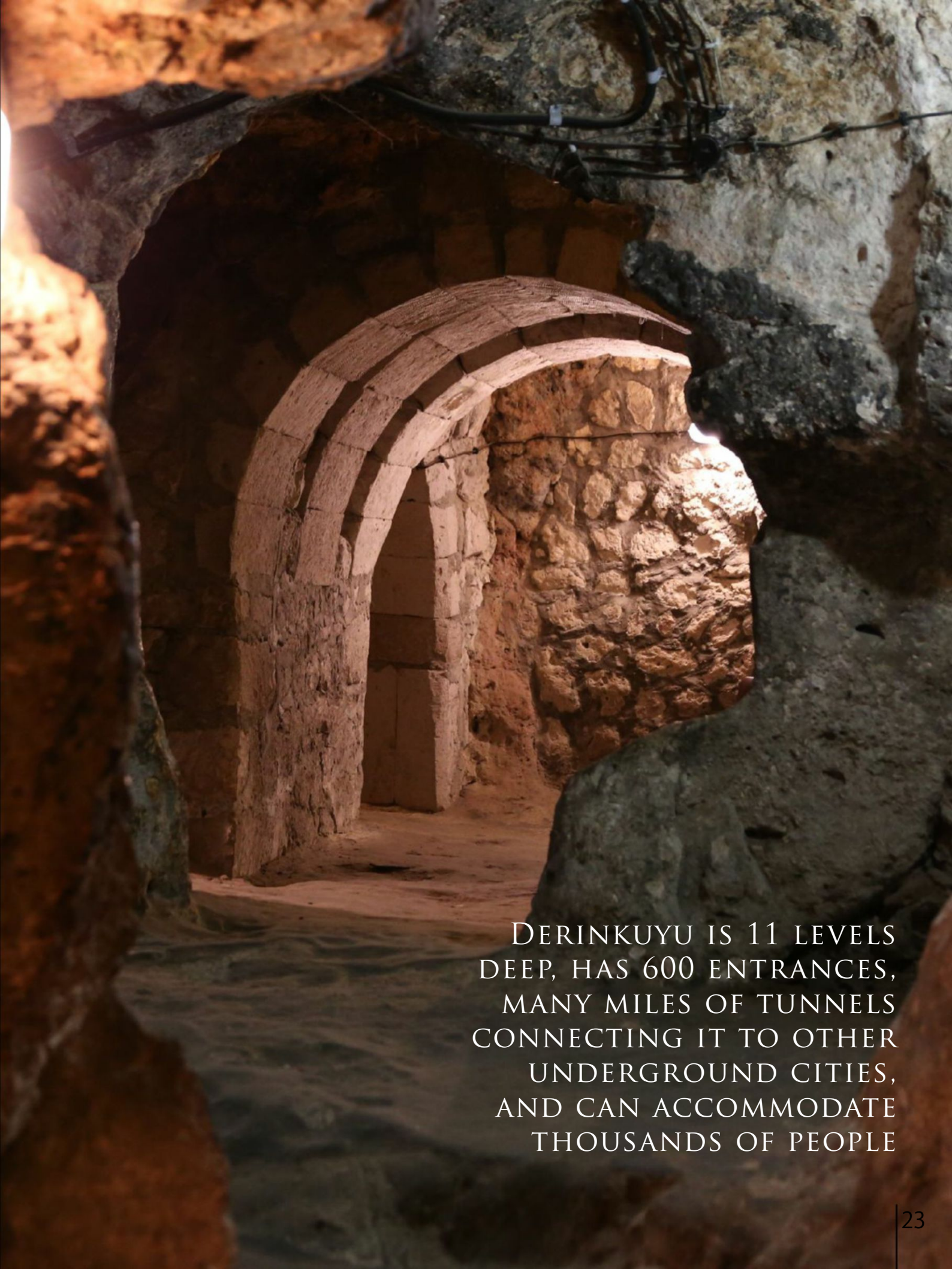
The subterranean city of Derinkuyu is 11 levels deep, has 600 entrances, many miles of tunnels connecting it to other underground cities, and can accommodate thousands of people. It is truly an underground city, with areas for sleeping, stables for livestock, wells, water tanks, pits for cooking, ventilation shafts, communal rooms, bathrooms, and tombs.

A five-mile tunnel connects Derinkuyu to Kaymaklı. Here the tunnels are lower, narrower, and more steeply inclined and the spaces are organized around ventilation shafts. Horses and other animals were stabled on the first floor, closest to the surface, to provide the animals access to the exterior and to prevent the methane gas from their dung polluting the caves' airflow. A large volcanic rock was found on the third floor, used for cold copper processing.



Photos: Derinkuyu Underground City





DERINKUYU IS 11 LEVELS
DEEP, HAS 600 ENTRANCES,
MANY MILES OF TUNNELS
CONNECTING IT TO OTHER
UNDERGROUND CITIES,
AND CAN ACCOMMODATE
THOUSANDS OF PEOPLE





MOST OF THE LEVELS WERE DUG OUT BY
EARLY CHRISTIANS TO PROVIDE THEM
WITH REFUGE FROM PERSECUTION



UNDER ATTACK

Most people did not occupy the underground cities on a permanent basis. Underneath the towns on the surface lies a vast network of tunnels, connecting each home in the area to the subterranean city. When the area came under attack, families would flee to their basements, rush through the dark tunnels, and gather in the underground city. Unwary soldiers could be caught in the many traps laid throughout the labyrinthine corridors, such as stones which could be rolled to block doorways and holes in the ceiling, through which spears could be dropped. Invaders were further outwitted by the Christian builders who made their tunnels narrow, forcing their enemies to fight, and to be picked off, one by one.

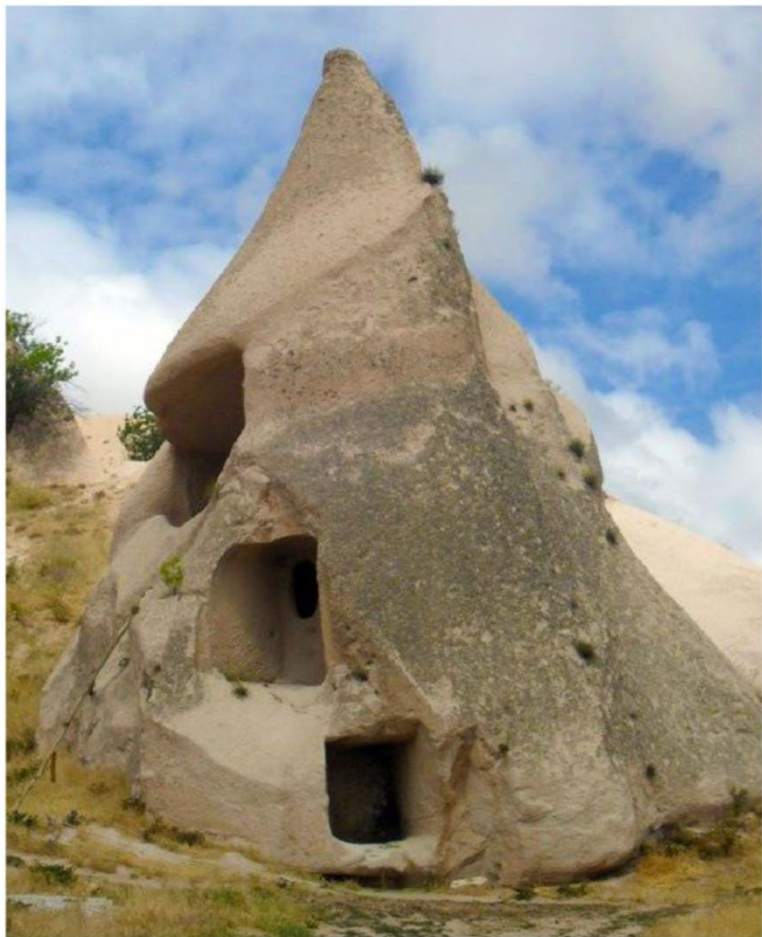
UNDERGROUND CITIES CONTINUE TO BE FOUND

In December 2014, another ancient subterranean city was discovered beneath Nevşehir fortress and the surrounding area, during an urban transformation project carried out by Turkey's Housing Development Administration. This city, consisting of at least 3.5 miles of tunnels, hidden churches, and escape galleries dating back around 5,000 years, was hailed as the "biggest archaeological finding in 2014" because it was identified as the first known underground city in which people permanently lived. Archaeologists have found that the subterranean passages and spaces are different from any other underground city found in the world. They discovered places where linseed oil was

produced, chapels, and tunnels combining various living spaces in the underground city.

It is hard to imagine anything surpassing the Derinkuyu underground city in both size and scope, but archaeologists were saying they had reason to believe this newly discovered subterranean city would be the largest of all the other underground cities in Nevşehir, and may even be the largest underground city in the world.

In 2017, another impressive underground city was discovered in the Gesi district. Named Belağası, this city has 52 rooms, stretching 262 feet in length.



Top: Abandoned Cavusin town in Cappadocia.
Left: Cave-rock house in Derwent valley.
Right: Abandoned fifth-century church of St John the Baptist
on the hill above Cavusin town. | Photos © Micki Pistorius

The Hole Truth? Hollow Earth Theory

According to Hollow Earth Theory, the Earth is a hollow planet with ancient entrances to the subterranean world scattered throughout it, including near both polar caps. Since ancient times, some have believed that there is an underground world inside our planet illuminated by a tiny sun, and it includes mountains, forests, and lakes.

Edmund Halley (1656 – 1742 AD), an English astronomer, geophysicist, mathematician, meteorologist, and physicist, may have been the first to develop a scientific hypothesis about a Hollow Earth. After a series of observations of the Earth's magnetic field, Halley concluded that the anomalies observed could only be explained if the Earth was composed of two spheres: an external solid one and an internal hollow one, each with its own magnetic axis.

The supposed evidence for the theory is that explorers have reported that air and water temperatures warm when approaching the North Pole. People have also claimed that when Richard E. Byrd, the first man to fly over the poles, said he went “beyond the Pole” he was referring to having entered inner Earth.

Central Asian Buddhists believe the wonderful land under our feet is known as Agartha - a place where beings are more beautiful and much wiser than we are. It has a king that has the power to read the human soul and this ‘King of the World’ resides in Shambhala.



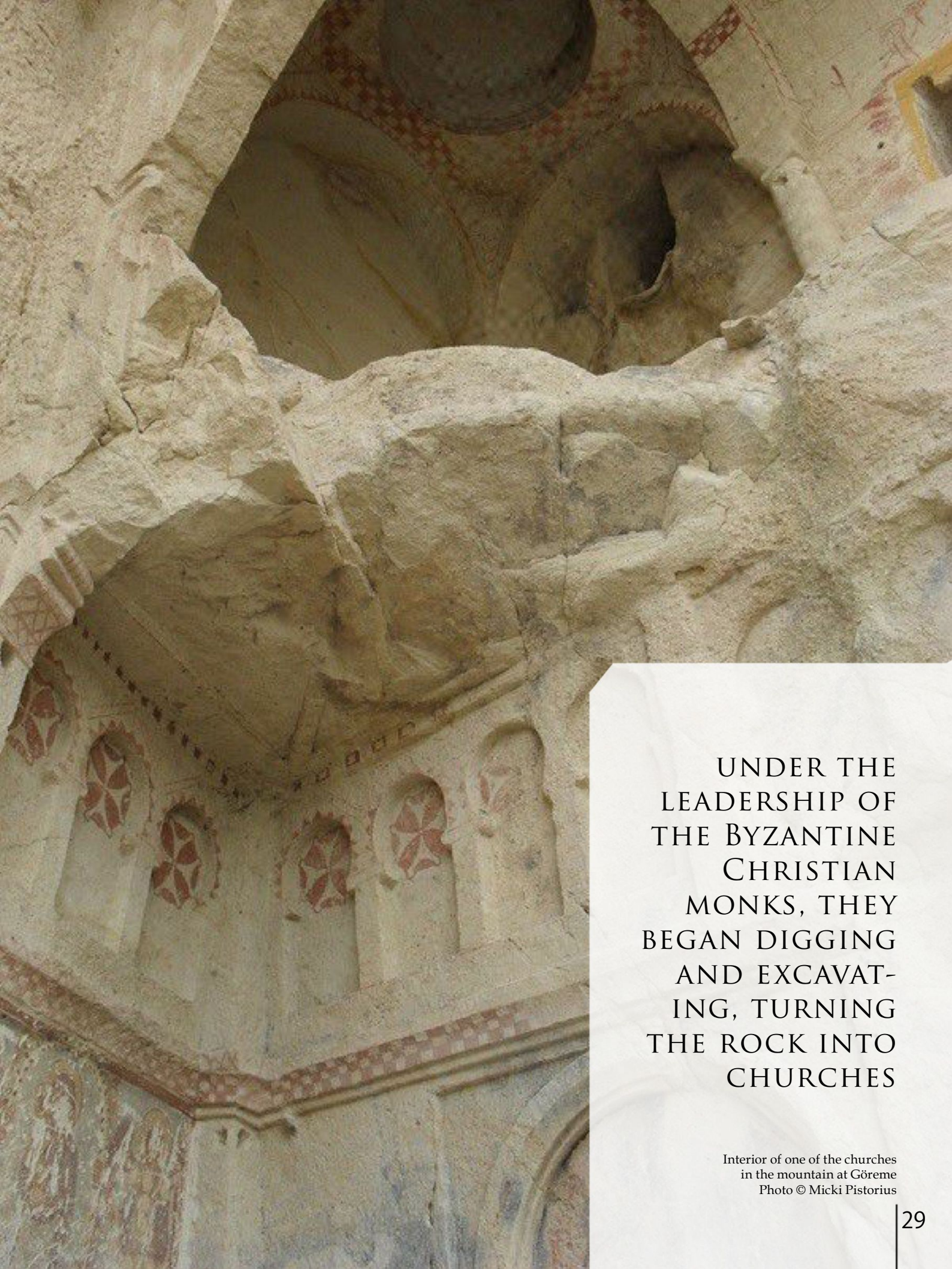
CAVE HOUSES AND CHURCHES

Besides the underground cities, Cappadocia is also famous for its Fairy Chimneys; cave-rock houses, and churches now preserved in the Göreme Open Air Museum. Göreme was inhabited as early as the Hittite era (1800 to 1200 BC), and later sat uncomfortably on the boundary between rival empires; first the Greeks and Persians, and later the Byzantine Greeks and a host of rivals. It became a monastic center in 300–1200 AD. By the fourth century AD, Christians fleeing Rome's persecution had arrived in large numbers and under the leadership of the Byzantine Christian monks, they began digging and excavating, turning the rock into churches. The main churches carved into the rock at Göreme are Tokalı Kilise (Church of the Buckle), comprising four chambers; Elmalı Kilise (Apple Church), Azize Barbara Kilise (Church of Saint Barbara), Yılanlı Kilise (the Snake Church), Karanlık Kilise (the Dark Church), and Çarıklı Kilise (the Church with Sandals). All are decorated with frescoes.

When the Greek Christians were exchanged for Turkish prisoners in 1923 AD, according to the Treaty of Lausanne, their churches were abandoned and their secrets were kept for almost 50 years, when they were rediscovered and restored. Today, millions of visitors marvel at this extraordinary combination of Mother Nature's and human nature's creativity.

It is believed people who settled in Göreme during the Roman period carved out houses from the soft rocks of volcanic deposits, creating the picturesque cave-rock towns. Some of these troglodyte dwellings have been turned into cozy hotels for tourists. Another cave-rock town is Cavusin, the village abandoned by the Greek Christians in 1923 AD. A fifth-century church of St John the Baptist was carved into the hillside above the village. The frescoes are now faded and the church was occupied by pigeons after the people left.

Wind and water erosion created Cappadocia's famous Fairy Chimney rock formations, leaving a hard cap on top of the pillar, some reaching a height of 130 feet. “Forests” of Fairy Chimneys turn the landscape into a surreal panorama, with no comparison on earth. ■



UNDER THE
LEADERSHIP OF
THE BYZANTINE
CHRISTIAN
MONKS, THEY
BEGAN DIGGING
AND EXCAVAT-
ING, TURNING
THE ROCK INTO
CHURCHES

Interior of one of the churches
in the mountain at Göreme
Photo © Micki Pistorius

FORESTS OF FAIRY
CHIMNEYS TURN THE
LANDSCAPE INTO A
SURREAL PANORAMA





TEN

MUST-VISIT SITES IN CAPPADOCIA

1 Explore Great Depths

Derinkuyu is Cappadocia's most thoroughly excavated and explored underground city. Visitors can explore eight levels of rooms, tunnels, and passageways, reaching depths of over 280 feet. Guided walking tours of Derinkuyu allow visitors to explore the remains of underground stables, cellars, storage rooms, churches, kitchens, wineries, wells, prisoner holding areas, and living areas, as well as peeking into the gigantic ventilation shafts left behind by the original creators centuries ago.

2 Labyrinth of Rooms

Derinkuyu and Kaymakli Underground Cities are close enough together to see both on a day trip. **Kaymakli Underground City** is Cappadocia's most spread out underground city, with a maze-like layout, although it doesn't go as deep as Derinkuyu. Visitors will be taken through a labyrinth of rooms and passageways across four levels, to see ventilation shafts, massive stone doors, a winery, church, stables, and a unique stone used as a melting pot for copper.

3 Living in Harmony

A visit to **Zelve Open Air Museum** gives visitors a unique look at one of the largest cave-dwelling communities in the region, which began life as a monastery in the ninth century AD. Visitors can wander through an amazing cave town where Christians and Muslims once lived together in harmony. The valleys are honeycombed with ancient dwellings and you can visit ancient churches, a monastery, and a rock-cut mosque.

4 Valley Retreat

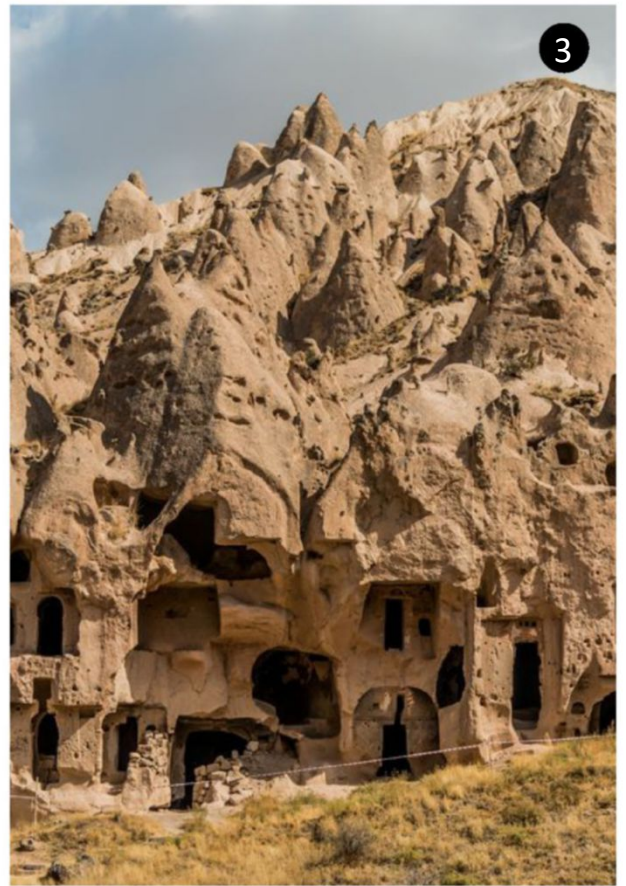
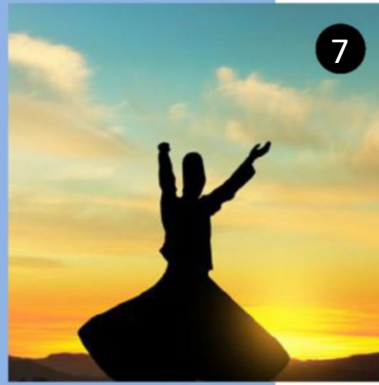
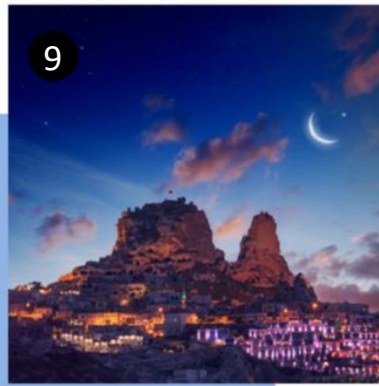
Ihlara Valley is a narrow valley at the bottom of a 330-foot deep gorge in southwest Cappadocia which once housed more than 4,000 dwellings and 100 cave churches, many decorated with frescoes. It was once a favored retreat for Byzantine hermetic monks, who carved churches and monasteries into the cliff face. Visitors begin at Ihlara village and end with Selime Monastery at Selime village after an 8.5-mile walk through the valley.

5 Carved into Stone

In the quaint **village of Çavuşin**, dozens of abandoned houses and churches remain carved into the hillside and are open for exploration. It is also dominated by two old Byzantine churches. The upper church is the great basilica of St John the Baptist, which is thought to be the oldest and biggest cave church in Cappadocia, dating to the fifth century AD. The lower church, Çavuşin Church, used to be called the Big Pigeon House Church as it was used as a local pigeon house in the early 20th century. Çavuşin Church was built in the 960s AD and was founded by a Byzantine general.

6 Byzantine Artistry

Göreme Open Air Museum is a UNESCO World Heritage site and one of the most visited sites in Cappadocia. It consists of a 10th-12th-century complex of rock-cut churches, chapels, and monasteries featuring fine monastic Byzantine artistry, as well as an important Byzantine monastic settlement that once housed around 20 monks. The history of Christianity in the region goes back as early as the fourth century AD, when St Basil established monastic communities there.



7 Sacred Springs

Hacıbektaş is a pilgrimage center for the followers of the Bektashi order of dervishes, founded by the 13th-century Iranian philosopher and Sufi mystic, Hacı Bektas Veli. Visitors can view the dervish dergah (lodge) which is a museum today, cilehane (suffering house), asevi (refectory), hamam (baths), and a cemevi (a temple where sacred services were held). A final gateway in the complex leads to the tomb of Hacı Bektas Veli. Nearby is a cave on Mount Ararat, which was used by Hacı Bektas Veli as an ordeal cell. Local belief holds that a person who passes through the hole in the rock will be purged of his sins. Also nearby is a sacred spring and a theater that seats 5,000 people.

8 Fairy Chimneys

Paşabağ Valley is famous for its mushroom-shaped rock formations, sometimes called ‘fairy chimneys’. Paşabağ is also known as Monks Valley because in the early Byzantine period, a group of disciples of St Simeon Stylites (a fourth-century monk, who spent his life on top of a pillar in northern Syria) devoted their lives to worship here. They carved their dwellings high up in the pinnacles of the rock formations to lead a hermitic life. Visitors can look inside a hermit’s shelter and a chapel dedicated to St Simeon which has been built into one of the fairy chimneys.

9 Towering Lookout

Uçhisar Castle is the highest point in Cappadocia from which you have a 360-degree view of the region. Filled with tunnels, the tall volcanic-rock outcrop was used for centuries by villagers as a place of refuge during attacks. Since the Ottoman Period, it was also used as a lookout and early warning system from which soldiers sent messages using light or mirror reflections.

10 Twin Valleys

If you haven’t had enough of rock-cut churches and monasteries by the time you’ve completed the first nine, then the **Twin Valleys of Soğanlı** are the place to go. The valleys are scattered with pyramid-shaped rock pinnacles that were first hollowed out in the Roman era for burials, and then later used by the Byzantines as places of refuge and worship. Dotted along the pathways are numerous hidden churches, rock-cut chapels with frescoes, and monk cells. ■

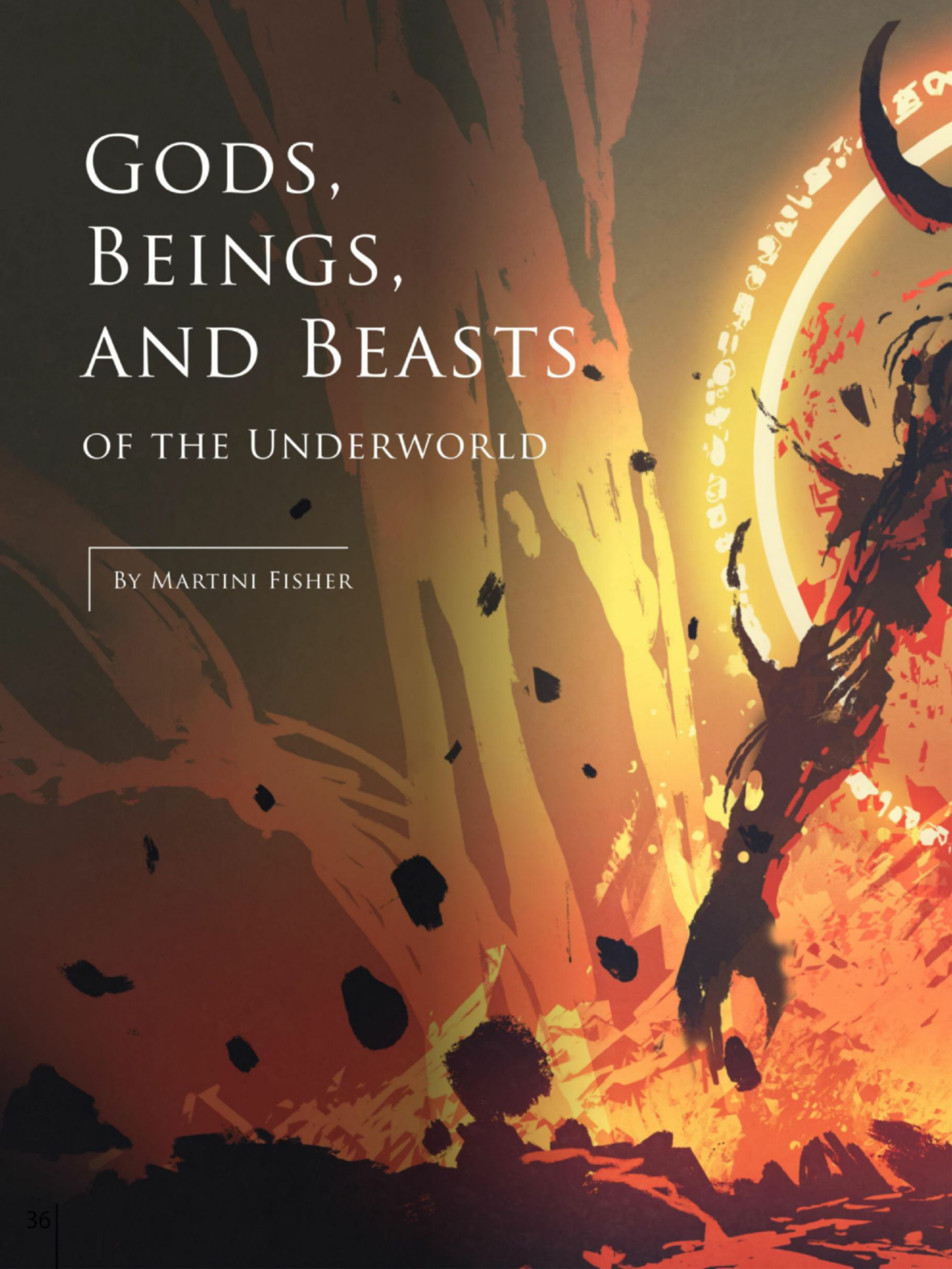


A woman in traditional Quechua clothing stands in a high-altitude, mountainous landscape. She wears a wide-brimmed hat with a colorful band, a vibrant, multi-colored shawl draped over her shoulders, and a red skirt with a decorative border. She is holding a long, thin object, possibly a staff or a tool, and looking towards the camera. The background features rugged, snow-capped mountains under a blue sky with scattered white clouds. The ground is covered in dry, yellowish grass and small rocks.

Traditional Clothing of the Quechua

Quechua people have used woven textiles for thousands of years. Some of the techniques and designs seen today can be traced back to pre-Inca cultures such as the Paracas, Huari, and Nazca. Traditional designs and weaving techniques have been passed down from generation to generation. The striking designs provide a glimpse into the myths of ancient Peru —when all textiles were imbued with meaning. Over 110 ancient designs have been identified from antique textiles; mostly animals, plants, and special symbols. Alpaca and sheep wool obtain vibrant colors with natural dyes from flowers, leaves, vines, fungus, and cochineal. Textiles are woven on a backstrap loom or a four-post loom. The most popular textiles are mantas or llicllas (women's carrying shawls), ponchos, chullos (knitted hats), and chuspas (traditional bags).

Subbotsky | AdobeStock



GODS, BEINGS, AND BEASTS.

OF THE UNDERWORLD

BY MARTINI FISHER



THE Underworld is one of the most feared places in world mythology. The ancient Chinese and Hindu cultures, for example, regarded the Underworld as a place of many levels of torture for those who sinned when they were alive. Although the ancient Greek and Mesopotamian Underworlds were generally viewed as dark and unpleasant places, they did not see it as quite so horrifying. Regardless of the many differing views of the functioning of the afterlife, every culture agreed that a colorful array of demons and evil spirits inhabited, and sometimes even ruled the Underworld.

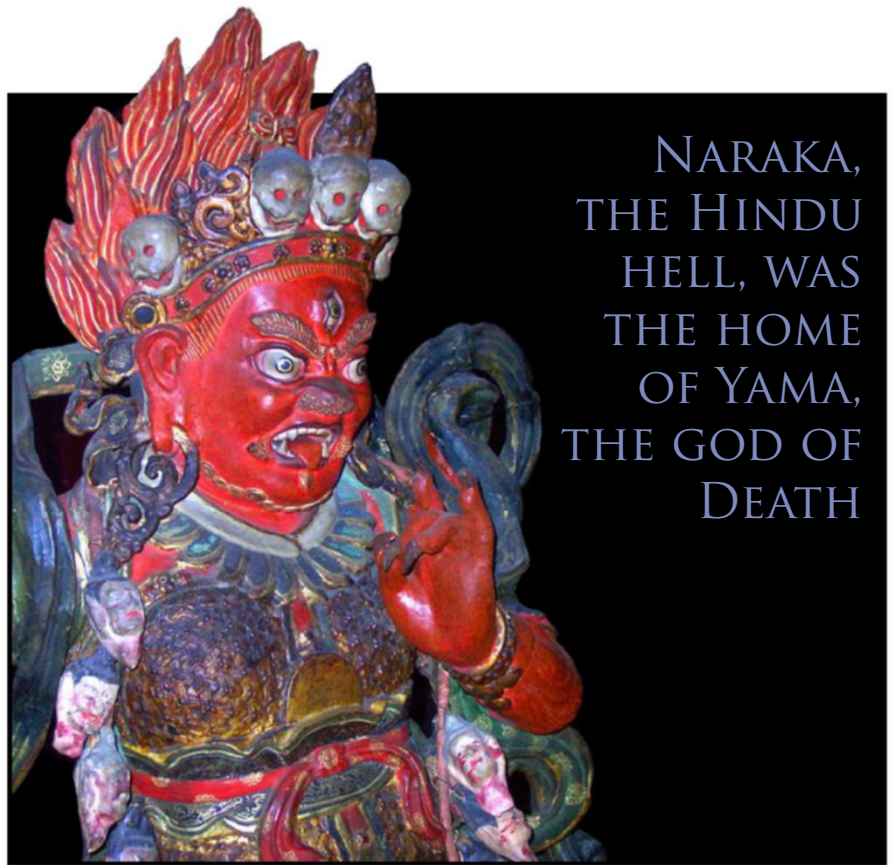
ANCIENT GREECE

HADES, CHARON, AND CERBERUS

Mostly depicted as a regal figure, Hades' appearance was not particularly frightening. Ruling the Underworld together with his wife, Persephone, Hades was also not particularly malevolent. As he also held power over the spoils of the earth, which included precious metals and life-giving soil, Hades dispatched his wealth upward into the realm of the living.

Although Hades himself was not particularly cruel or terrifying, he was the caretaker of some sinister figures in the Underworld. Charon, the ferryman of the dead, was an ugly, bearded man with a crooked nose. It was Charon who transported souls across the river Styx in his skiff.

The hound of Hades, Cerberus, was a three-headed dog with a serpent's tail, a mane of snakes, and lion claws, that guarded the gates of the Underworld to prevent the dead from leaving. Chained to the entrance gates of Acheron, a river of the Underworld, Cerberus fawned on the dead or new spirits as they entered but would savagely eat anyone trying to pass back through the gates and return to the land of the living without permission.



NARAKA,
THE HINDU
HELL, WAS
THE HOME
OF YAMA,
THE GOD OF
DEATH

Statue of Yama, Hindu god of Death in Tibet. | Ancheta Wis/CC BY 2.0

HINDU

YAMA, YAMADUTAS, AND CHITRAGUPTA

Naraka, the Hindu hell, was the home of Yama, the god of Death. Yama was the first man and his sister, Yami, was the first woman. As Yama died without children and could not continue the cycle of rebirth, he remained forever in the land of the dead as its ruler. Yama had four arms, protruding fangs, and a complexion likened to storm clouds with a wrathful expression. He was surrounded by a garland of flames, and rode a water-buffalo. He wielded a noose with which he seized the lives of people who were about to die.

After death, messengers of Yama called the Yamadutas brought all beings to the court of Yama, where he weighed the beings' virtues and vices and passed a judgment, sending the virtuous to Svarga (heaven) and the sinners to one of the levels of Naraka to be punished before being reborn as lower or higher beings as per their merits. The Yamadutas were also assigned the job of executing the punishments on sinners in the various hells.

Yama was also aided by his minister Chitragupta, who kept a record of all good and evil actions of every living being. Chitragupta came into being after the creator god Brahma entered into a meditation trance for 11,000 years. When he opened his eyes, Brahma saw a man holding a pen and inkpot in his hands and a sword girdled to his waist. Brahma then sent him to help Yama dispense justice and punish those who violated their dharma.

Continues on page 40

Spirit Coins of Ancient Greece

By Wu Mingren



Charon ferrying in the underworld. | José Benlliure y Gil, circa 1930

Exposing the Shady Secrets of Charon's Obols

Charon's obols were coins used by the ancient Greeks for funerary purposes. They believed these coins were used by the spirits of the dead to pay for their journey with Charon, ferryman of the Underworld, across the River Styx, which formed a boundary between the world of the living and the world of the dead. According to literary sources, such as the works of Aeschylus, Aristophanes, Ovid, and Virgil, if a dead person was buried, a coin would be placed in their mouth to pay their way.

Charon has been portrayed in Greek vase paintings, where he is commonly depicted as an ugly, bearded man with a crooked nose, wearing a

conical hat and tunic. He's often shown standing in his boat holding an oar and waiting to receive the souls of the newly deceased.

Charon didn't ferry his passengers for free. They would be required to pay him an obol for his service. Some sources mention that if one was not able to pay the ferryman, they would need to wander on the earthly side of the river for a hundred years before being allowed to cross it.

The Greek word 'obol' originally meant 'roasting spit', as bundles of iron roasting spits once served as a type of currency before coins were minted. When coins came into use, the obol was the name given to small silver coins that were valued at one-sixth of a drachma.

After the conquest of Greece by the Romans, the obol was used to describe any low-value bronze coin. While literary sources state that the obol was placed in the mouth of the deceased, only a small proportion of burials found in ancient Greek cemeteries have been found to contain coins. This suggests the practice may not have been as widespread as literary sources claim.

In some cases, the dead were buried with more than one coin and these were placed on various parts of the body, not just in the mouth. It is also possible that coins were placed with the dead for purposes other than paying for a boat ride into the Underworld. ■

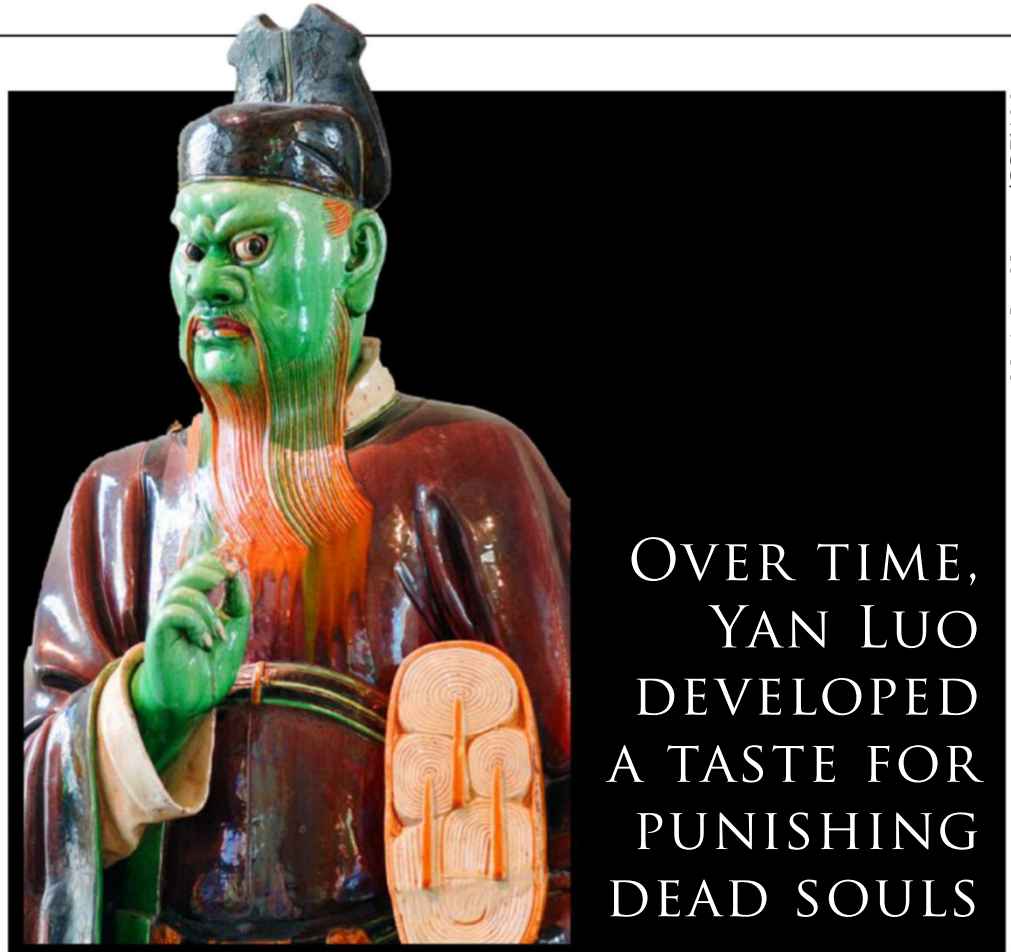
CHINA

YAN LUO, OX-HEAD, AND HORSE-FACE

Depictions of Diyu ("earth prison"), the Chinese Underworld, can be traced back to commemorative inscriptions on bronze vessels in Shang and Zhou tombs (circa 1600-256 BC) referencing an "underground" realm inhabited by the deceased. Although the number of levels of Diyu differ between Buddhist and Taoist interpretations, each court of hell dealt with different creative forms of punishments.

The god of death and the ruler of hell, Yan Luo, was usually depicted as a middle-aged man standing in priestly robes waiting for the souls of the deceased to be brought before him for judgment. Yan Luo was originally assigned to the First Court of Hell. However, as he proved to be too sympathetic and lenient, too many souls were crossing the Golden Bridge to heaven. As a result, the Jade Emperor reassigned Yan Luo to the Fifth Court of Hell - "the Hell of Wailing, Gouging and Boiling". Over time, Yan Luo developed a taste for punishing dead souls and executed his role more effectively.

Yan Luo had two assistants, "Ox-Head" and "Horse-Face". Although both creatures had the bodies of men, as you might imagine, Ox-Head had the head of an ox while Horse-Face had the face of a horse. Ox-Head and Horse-Face met the soul as soon as it entered the Underworld and escorted the wicked soul to Yan Luo for judgment.



Marie-Lan Nguyen/CC BY 3.0

OVER TIME,
YAN LUO
DEVELOPED
A TASTE FOR
PUNISHING
DEAD SOULS

An assistant to the Judge of Hell. Ming Dynasty, 16th century, China.

ANCIENT EGYPT

OSIRIS, ANUBIS, AND AMMIT

In Egyptian mythology, Osiris was the judge of the dead and the one who also granted life. The Osiris myth is integral to the ancient Egyptian concepts of kingship and succession, order and chaos, as well as death and the after-life. Having inherited the kingship from his ancestors in a lineage stretching back to Ra, the creator of the world, Osiris ruled Egypt. His queen was Isis who, along with Osiris and Seth, was one of the children of the earth god Geb and the sky goddess Nut. While Osiris was associated with life-giving power, righteous kingship, and natural order, Seth was closely associated with violence and chaos.

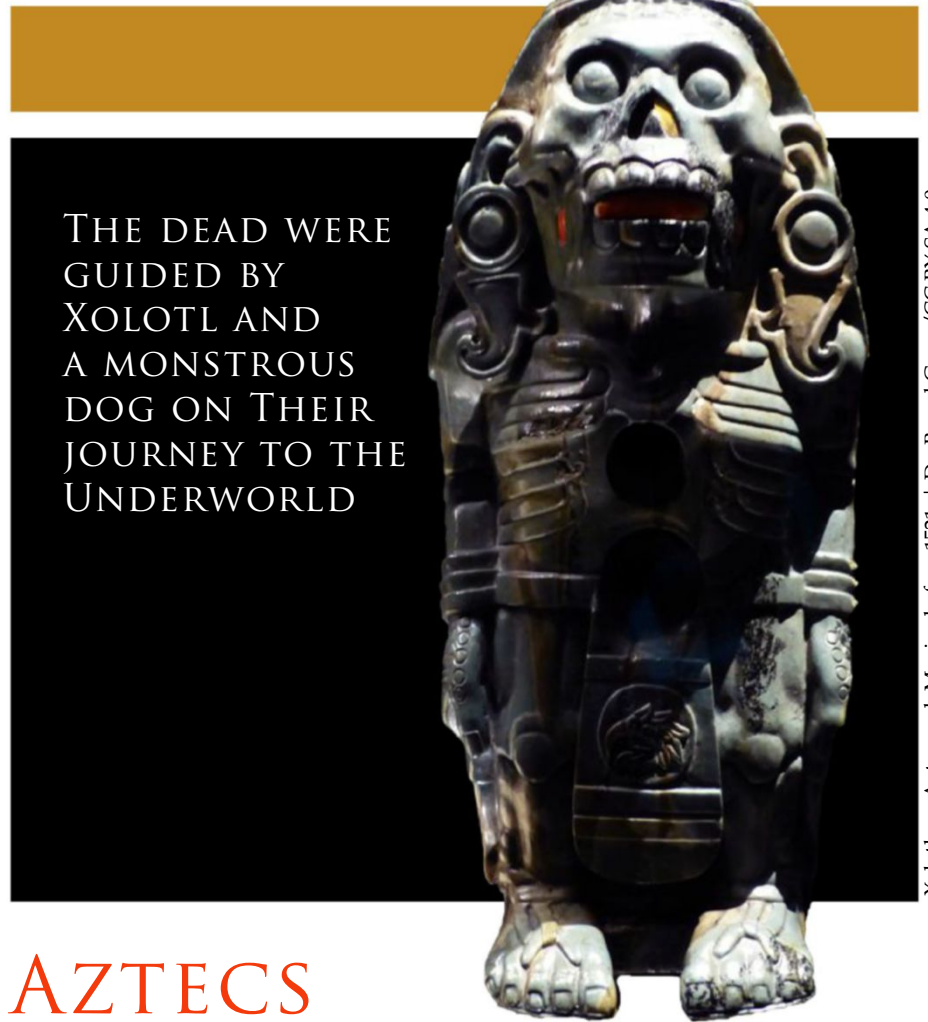
After death, a person faced judgment. If they had led a virtuous life, the person was welcomed into the kingdom of Osiris. The god Anubis, the god with the head of a jackal, weighed the deceased's heart against the feather of Ma'at, the goddess of justice and truth. If the heart was proven heavier than the feather, then the heart was "impure," and Ammit would eat it, thus dooming the person to wander as a restless spirit.

Ammit, the "Devourer of the Dead", was a demon with a head of a crocodile, front body of a lion, and the back body of a hippo.

THE BOOK OF
THE DEAD IS
AN ANCIENT
EGYPTIAN
FUNERARY TEXT
CONSISTING OF
A NUMBER OF
MAGIC SPELLS
INTENDED TO
ASSIST A DEAD
PERSON'S JOUR-
NEY THROUGH
THE DUAT, OR
UNDERWORLD,
AND INTO THE
AFTERLIFE

GODDESS HEL

The ancient Norse believed in different kinds of places that souls go to after they die. The most famous of these dwelling-places of the dead is Valhalla (the hall of the fallen), the great hall of the god Odin where those chosen by Odin and his Valkyries live as celebrated heroes until they are called upon to fight in the final battle at Ragnarok. The goddess Freya also welcomed some of the dead into her hall, Fólkvangr (the field of the people). However, the Underworld to which the dead were most commonly portrayed as going to was Hel, a world beneath the ground presided over by a goddess, also named Hel. The 13th-century scholar Snorri Sturluson identified Hel as the daughter of Loki and the giantess Angrboda. This made her the sister of the wolf Fenrir and the world serpent, Jormungand. She struck a grisly figure with half of her body appearing like a rotting corpse. However, she was not born a goddess of the afterlife. The title was forced upon her when the three goddesses of fate had prophesied that the children of Loki - Hel and her siblings - would cause the death of the leaders of the Norse pantheon. To spare himself that fate, Odin hurled them to the far corners of the world. Odin cast Hel below the roots of the World Tree to rule over the cold, dark world of the dead.



Xolotl, an Aztec god, Mexico before 1521. | Dr. Bernd Gross/CC BY SA 4.0

THE DEAD WERE
GUIDED BY
XOLOTL AND
A MONSTROUS
DOG ON THEIR
JOURNEY TO THE
UNDERWORLD

AZTECS

MICTLANTECUHTLI, MICTECACIHUATL, XOLOTL, AND HIS DOG

Mictlan, the Aztec Underworld is ruled by King Mictlantecuhtli ("Lord of the Underworld") and his wife, Mictecacihuatl ("Lady of the Underworld"). Depicted as a bloody skeleton with bones shoved into his ears, draped with a necklace of human eyes, Mictlantecuhtli both devoured the dead and was worshiped as a healer. Mictecacihuatl, his wife, was said to have been made a human sacrifice as an infant. Represented with a flayed body and with jaw agape to swallow the stars during the day, Mictecacihuatl ruled over the afterlife alongside her husband.

Most people who died would have traveled to Mictlan, which consisted of nine distinct levels. The dead were guided by Xolotl and a monstrous dog on their journey to the Underworld. In art, Xolotl was typically depicted as a dog-headed man, a skeleton, or a monster with reversed feet. The duty of the monstrous dog was to help the soul cross a deep river. The dead then had to pass difficult challenges such as crossing mountains which crashed into each other, crossing a field with a wind that blew flesh-scraping knives and a river of blood guarded by fear-some jaguars.

MESOPOTAMIA

ERESHKIGAL, NERGAL, AND SHAMASH

In Mesopotamian religion, Irkalla, the Underworld, was ruled by the goddess Ereshkigal and her consort Nergal, the god of war. It was a dark and dreary world where the shades of the dead sucked on clay and dust. On their way to the Underworld, souls would have passed through seven gates where they would have been stripped of their possessions and their clothes before entering Ereshkigal's realm with absolutely nothing. Even Nergal was not exempt from this rule. When Nergal entered the Underworld for the first time, the gatekeeper Neti allowed him through the seven gates of the Underworld while stripping him of everything until he reached the throne room.

There was no judgment or punishment under Ereshkigal's rule, only equality. The Anunnaki, the court of the Underworld, welcomed each spirit and received their offerings. The court then explained the rules and assigned the spirits their fate and position in the Underworld, much the same way they had when they were alive. Another court was presided over by the sun god Shamash, who visited the Underworld on his daily rounds. Shamash also punished any ghosts who caused problems for the living as well as handing out funerary offerings to ghosts who no longer had living relatives to make offerings for them.



Ancient Parthian relief carving depicting Nergal, the ancient Mesopotamian god of death and plague.

TURKIC- MONGOL

LORD ERLIK

Erlik was the lord of the lower world and judge of the dead in Turkic mythology. In the prayers of shamans of the Turko-Mongol people in Siberia, Erlik was described as an old man with a well-built physique and the face and teeth of a pig. Erlik was the first creation of Bai-Ulgen, the creator god. When Bai-Ulgen saw a piece of mud floating in the ocean one day, he gave it a spirit and named it Erlik.

One day, while Bai-Ulgen was modeling humans out of clay, he realized that he could not give them life. He went to the fire-demon blacksmith Kudaai Bakhshilaan to ask for his assistance. Seeing this, Erlik defiled Bai-Ulgen's creations by spitting on them. On his return, Bai-Ulgen turned the clay models inside out. Erlik was then banished to the ninth layer of the Earth, but not before taking some of the soulless clay dolls with him. These clay dolls later became his sons and daughters who helped their father in the ways of evil, misfortune, sickness, and death. Erlik took charge of all those who were dead, leaving Bai-Ulgen in charge of the living.

THE CLAY
DOLLS LATER
BECAME HIS
SONS AND
DAUGHTERS
WHO HELPED
THEIR FATHER
IN THE WAYS
OF EVIL



BATARA KALA

Batara Kala, the Javanese demon god who ruled the Underworld, was born when the creator god Batara Guru's chief consort Dewi Uma rejected his sexual advances while they were flying through the heavens. In a fit of lust, Batara Guru forced himself upon her on top of his divine cow, Nandi. However, Dewi Uma fiercely resisted and his semen spilled into the ocean. This holy semen was eaten by a fish which then gave birth to Batara Kala. Angry at his consort's refusal, Batara Guru banished Dewi Uma to the human world where she raised Batara Kala.

Batara Kala grew to be a fierce ogre with an insatiable appetite and rude behavior. Being universally disliked, yet still respected as the son of Batara Guru, Batara Kala was sent to Earth by the gods to punish the wicked. Unfortunately, Batara Kala was only interested in eating people at random to satisfy his appetite. To stop him from doing more damage on Earth, he was later made the ruler of the Underworld.

The old gods were as diverse as the people who worshiped them in their many different shapes and sizes. Likewise, the rulers of

the Underworld have worn many faces. They had many different forms, depending on the culture and religion of the worshippers. As death and birth are major parts of human life, these deities often became some of the most important figures of a culture. ■



Batara Kala

WHAT LIES
BENEATH
TEOTIH



UACAN

MEXICO'S CITY OF THE GODS?

BY MARCO VIGATO

AT its peak, around 200 AD, Teotihuacan counted a population of well over 125,000, boasted hundreds of temples and palaces, and three massive pyramids named after the Sun, the Moon, and the Feathered Serpent (itself a symbol of the planet Venus). The ruins of what is often called the Rome of America, Teotihuacan lies a mere 31 miles north-east of modern-day Mexico City. By the time the Aztecs came onto the scene, at the beginning of the 14th century AD, the ancient metropolis already lay in ruins, its great pyramids covered in shrubs and vegetation. No doubt the Aztecs were left with the same questions that every modern visitor to the site is confronted with today; Who were the mysterious builders of Teotihuacan, and where had they come from? To the Aztecs, the answer to this question could be none other than the gods themselves.





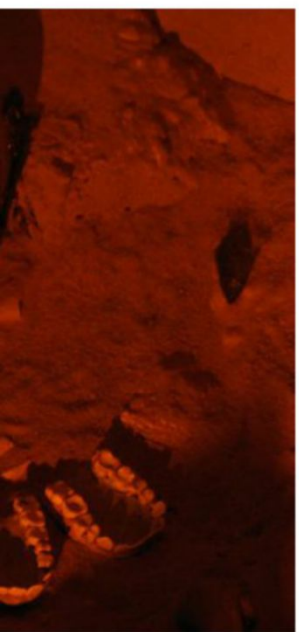
Their legends told of the arrival of wise men from a land beyond the sea. “They say they came to this land to rule over it”; wrote Spanish chronicler Bernardino of Sahagún: “They came from the sea on ships, a multitude of them, and landed on the shore of the sea, to the north...from there they went on, seeking the white mountains, the smoky mountains...led by their priests and by the voice of their gods. Finally, they came to the place that they called Tamoanchan...and there they settled for some time...but it was not for long, for their wise masters left, took again to their boats...bringing back with them all their holy books and their sacred images.”

THE TEOTIHUACAN UNDERWORLD

Few of the modern visitors to Teotihuacan are aware of the vast and mysterious underworld of caves and man-made tunnels that extend under much of the ancient site and for miles around. The existence of these tunnels has been known for centuries, but not even the most recent research has been able to solve the mystery of their origin and purpose. Very much like at Giza, in Egypt, these tunnels are rumored to connect all the main pyramids by means of underground passageways, and perhaps even lead to the records of a lost civilization.

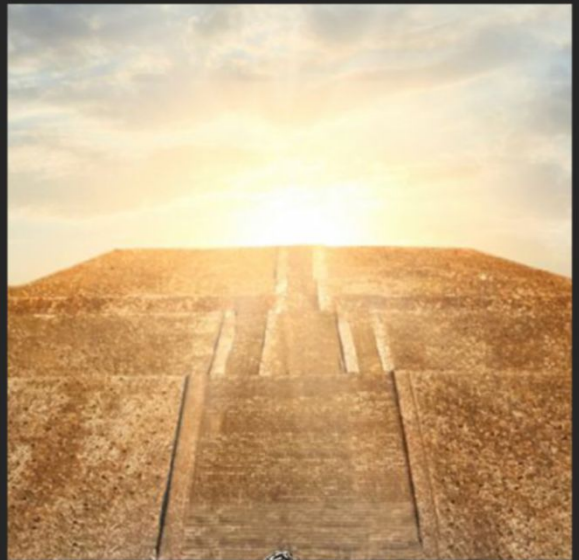


S.Shepherd/CC BY 2.0



The French explorer and anthropologist Desiré Charnay was among the first Europeans to penetrate this labyrinth of tunnels in modern times and leave a detailed account of it. In his 1880 book *Les Anciennes Villes du Nouveau Monde*, Charnay recounts having been led by his guide to some cavernous quarries, two-and-a-half miles west of the Pyramid of the Moon. There he observed the entrances to several galleries, branching off in different directions at regular angles. These led to different chambers, which he described as “large halls”, one in particular “shaped like a rotunda” and filled with human remains.

CITY OF THE SUN



The Xolotol Codex shows the word “Teohuacan” written underneath a pictogram referring to a city as a combination of sun, temple, and ruler symbols. Teohuacan would be translated as “the city of the sun.”

Veronica Ortega, an archaeologist at the Mexican National Institute of Anthropology and History, explains that this contrasts with the title Teotihuacan, as the city name is given in later codices. Teotihuacan has been translated as “the city of the gods” or “the place where men become gods. According to Ortega, the Spanish made the name change in their codices to remove the sun. She suggests they did so because the sun was a symbol of authority and the Spanish conquistadors were threatened by the idea of the city having been an important governmental site.

Charnay had no doubt that these tunnels had been dug in ancient times, and he speculated these could have served as quarries to build the many structures above ground in Teotihuacan and were only later turned into catacombs. Charnay followed another tunnel a little farther than half-a-mile, without approaching its end. The tunnel never deviated from its course and appeared to point in the direction of the Pyramid of the Sun, almost 1.2 miles further to the south-east. Interestingly, these tunnels seemed to be partially dug into the volcanic conglomerate that covers the entire valley to a depth of several feet, and part into the much harder bedrock.

A local legend collected by Peter Tompkins in his *Mysteries of the Mexican Pyramids*, has one of these caves running on a straight line to Amecameca, some 40 miles to the south-east. The existence of these subterranean caves was certainly well known to bandits and revolutionaries during the 1800s and early 1900s, as many of them allegedly took refuge in the caves at the time.

Geologists believe that this set of cavities originated millions of years ago, when intense volcanic activity in the area left a network of lava tubes and bubble-shaped caves, some as much as 65.6 feet high and up to 328 feet in length. The ancient inhabitants of Teotihuacan certainly enlarged and expanded these natural cavities as a source of construction material. Millions of tons of volcanic rocks were extracted from these tunnels, although it is unclear why the ancient Teotihuacans did not choose the much more accessible deposits above ground. Rather, they chose to dig a maze of tunnels in near-complete darkness, under constant threat of cave-ins and floods.

Already over the course of the 1950s, French-American archaeologist René Millon speculated that the largest pyramids could have been built on top of vast underground cavities. Digging under the Pyramid of the Sun, he found evidence of a huge blocked pit, which he believed could lead to a tomb “of immense proportions.” It was not until 1971, however, that excavations revealed the entrance to an ancient tunnel underneath the pyramid. The passage ran in an easterly direction for about 328 feet, ending in a system of chambers arranged in the shape of a four-leaf clover, very near the center of the pyramid. The tunnel appeared to have been deliberately blocked and sealed in antiquity, but the chambers were found to be completely empty except for a few small obsidian artifacts and pottery fragments. No trace of the “huge pit” reported by Millon was found.

View of the “Cueva del Pirul”, one of the largest systems of interconnected caves to the east of the Pyramid of the Sun. The many rough pillars support the roof and a number of side passages branching out in different directions.

| Photo © Marco M. Vigato

DIGGING UNDER
THE PYRAMID OF
THE SUN, RENÉ
MILLON FOUND
EVIDENCE OF A
HUGE BLOCKED
PIT, WHICH HE
BELIEVED COULD
LEAD TO A TOMB
“OF IMMENSE
PROPORTIONS”





Above: "Cueva del Pirul", one of the largest systems
Below: Location of the main cave system, a few hundred meters to the east of the Pyramid of the Sun (visible in the distance).

Opposite: Some of the caves present extensive burn marks on the walls and ceilings, which testify of long and intense ritual activity. | Photos © Marco M. Vigato



QUARRY, TOMB, OR CEREMONIAL SITE?

Over the course of the 1990s and early 2000s, archaeologist Linda Manzanilla of the Autonomous University of Mexico led a comprehensive examination of the caves and tunnels under Teotihuacan. She reached the conclusion that the vast majority of the tunnels accessible today were man-made, and not natural lava tubes. She suggested they had most likely originated as quarries but were later used for a number of funerary and ritualistic purposes.

In the early months of 2017, I was able to personally explore a section of the tunnels located less than a few hundred feet to the east of the Pyramid of the Sun. Most of the entrances and side passages have been blocked in modern times, but it is still possible to follow their course for a short distance.

Some more tunnels branch out from a vast chamber resting on rough rock-cut columns or pillars. One of those can be followed for a distance of perhaps 160 to 200 feet to a pit from where more passageways branch out. The loose conglomerate that forms the walls and ceiling of the tunnels and chambers does not encourage further exploration at the risk of cave-ins. Even in their present dilapidated condition, the tunnels follow a regular plan with fairly constant height and width. It is possible that some of the deeper tunnels continue under the much harder basalt bedrock, as the ones visited and described by Charnay in 1880. The existing tunnel entrances could thus represent an attempt by later occupants of the site to penetrate a much deeper and perhaps far older labyrinth. For the inhabitants of Teotihuacan, the labyrinthine

network of caves and tunnels under the city represented the entrance to the Underworld. In the Codex Xolotl, the glyph used to represent Teotihuacan contains the depiction of two pyramids above a cave with a person inside. This suggests a possible connection with the Aztec traditions of Chicomoztoc, the “Place of the seven caves”, from which the present humanity was said to have emerged after a previous world was destroyed.

In 2003, the entrance to a previously unknown tunnel was discovered under the pyramid of Quetzalcoatl. The tunnel ran about 328 feet and had been intentionally sealed with large boulders in antiquity. Archaeologist Sergio Gomez has since described the tunnel as “one of the most important discoveries in the history of Mexico”.







The tunnel, with continued exploration, has since revealed over 50,000 artifacts. Particularly puzzling has been the discovery in 2013 of hundreds of metallic spheres, ranging from 1.57 to 4.7 inches across. The spheres appear to have been covered in pyrite, with a core of clay and other unidentified compounds.

At the end of the tunnel lies what is likely a system of three chambers, still awaiting exploration. In one of the chambers, vast quantities of liquid mercury were detected. Gomez speculates that these veritable “pools” of liquid mercury could have symbolized an Underworld river or lake.

Many ancient civilizations, particularly the Chinese, considered mercury a vehicle for immortality. However, due to its high toxicity and complex extraction, the discovery of liquid mercury is extremely unusual at ancient sites and is virtually unparalleled in Mesoamerica. If the caves and tunnels of Teotihuacan were designed as a symbolic representation of the Underworld, it is very well possible that the new tunnels recently discovered under the Pyramid of the Feathered Serpent could one day lead to a mythical tomb, perhaps the final resting place of a mysterious ruling elite responsible for the construction of Teotihuacan and for the monumental megalithic architecture present at the site.

It is equally possible that the exploration of some of the other tunnel systems to the east of the Pyramid of the Sun and to the west of the Pyramid of the Moon, including the ones entered by Charnay and never again explored, could lead to similar discoveries. Very much like at Giza, these tunnels could lead to some sort of Mesoamerican equivalent to an ancient “Hall of Records”, whose discovery could finally help to shed light on the origins of Teotihuacan and its “gods”. ■

In the “Cueva del Pirul”, one of the largest systems of interconnected caves to the east of the Pyramid of the Sun.

| Photo © Marco M. Vigato



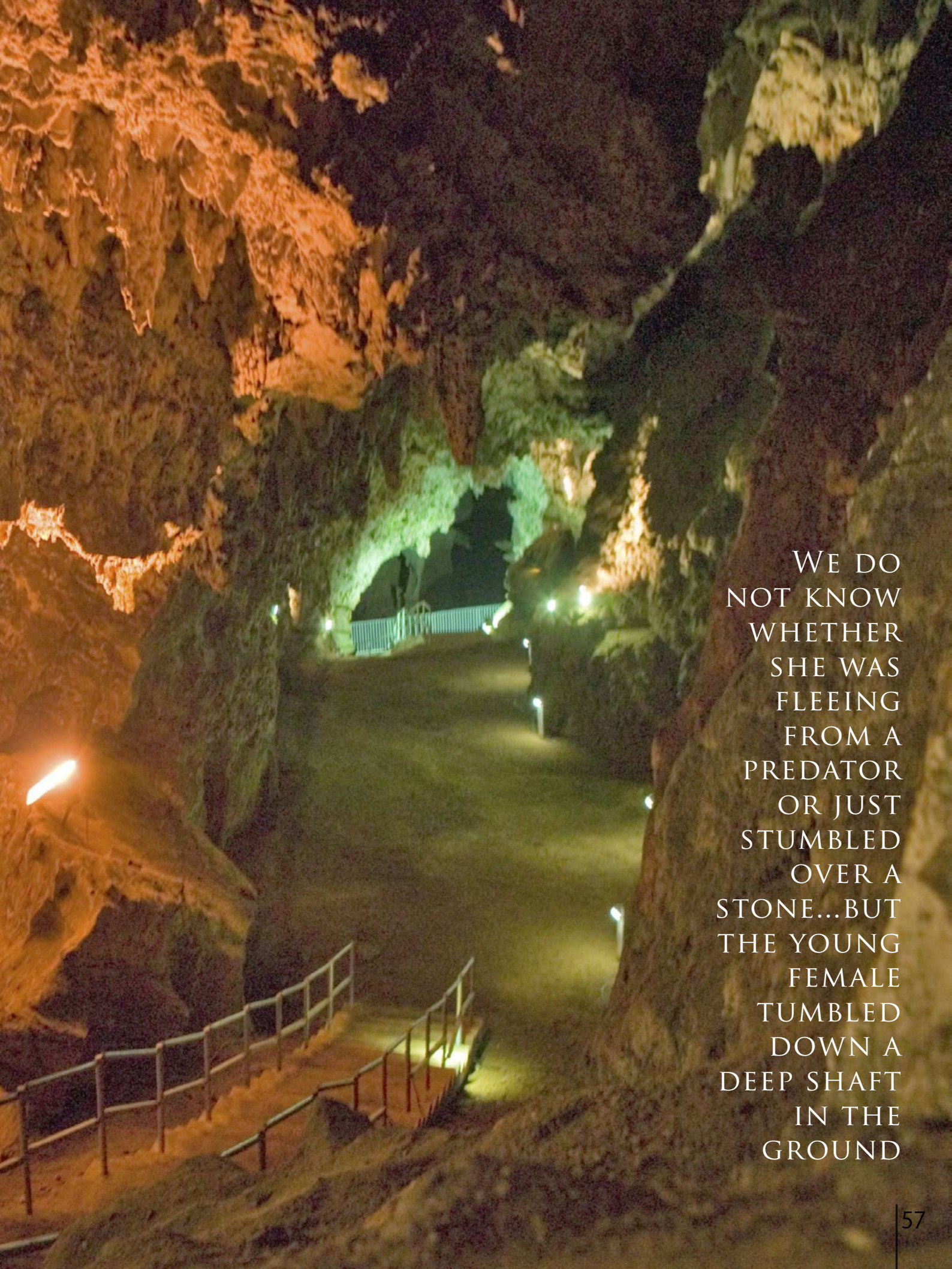
STERKFONTAIN CAVES

HOME OF MRS. PLES AND LITTLE FOOT

BY DR. MICKI PISTORIUS

MORE than three million years ago, a young female wandered the landscape of what is today called the Cradle of Humankind in the Gauteng province of South Africa. Her physique was smaller than modern humans and she had a smaller brain, but she walked upright (bipedal) and she had huge hands and a divergent big toe, which gave her an excellent ability to climb trees to escape predators at night. On this particular day, however, she was not that lucky. We do not know whether she was fleeing from a predator or just stumbled over a stone, but the young female tumbled down a deep shaft in the ground. She never got out of the cave alive and she never realized the significance of her existence to humankind millions of years later. Today her skeleton lies encased in glass at the University of Witwatersrand. She has been dubbed 'Little Foot'. Little Foot shares her address, the Sterkfontein Caves, with another famous hominid—Mrs. Ples.



A photograph of a cave interior. The cave walls are rugged and textured, with some areas illuminated by warm orange light and others by cooler green light. A path leads into the distance, flanked by a metal railing. In the foreground, a set of stairs with a metal railing leads down. The overall atmosphere is mysterious and dimly lit.

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Around 2.5 billion years ago, the area known today as the Cradle of Humankind was a shallow inland sea. The Sterkfontein Cave complex is situated about 31 miles northwest of Johannesburg, in the south-western section of the Cradle of Humankind – declared a UNESCO World Heritage Site in 1999. In the late 1970s, anthropologist, geologist, and climatologist Professor Tim Partridge had developed the theory of the Sterkfontein Formation, dividing the Sterkfontein depositional sequence into chronostratigraphic units. This sequence comprises six members ordered stratigraphically with Member one being the lowest and Member six at the top. Three genera of hominin and possibly five species, most attributed to the *Australopithecus* genus, have been identified at Member four. An estimated 40 percent of all the world's human fossils have been found in the Cradle of Humankind and more than 9,000 stone tools have been found at the Sterkfontein Caves.

At the end of the 19th century, the gold reef of the old Transvaal Republic (today Gauteng province) attracted many prospectors digging for gold. Despite geologists calling for the Sterkfontein Caves to be protected, by 1896 the miners dynamited the Sterkfontein Caves in their search for limestone, which was converted into lime to process the gold. David Draper, a geologist, had managed to convince the miners not to blast the main cave because of its stalactites, stalagmites, and pristine underground lake. However, the fossils were not protected, and in this process a multitude of fossils literally became a 'gold mine' for palaeoanthropologists to collect and analyze. On April 18, 1947, Dr. Robert Bloom and John T Robinson discovered Mrs. Ples, the most complete skull of an *Australopithecus africanus* ever found. In 1994, palaeoanthropologist Professor Ronald Clarke recognized four foot bones as belonging to *Australopithecus*, and together with palaeoanthropologist Professor Phillip Tobias, in 1995 they announced the discovery of 'fossil StW 573', nicknamed "Little Foot".

MR. OR MRS. PLES?

The skull of Mrs. Ples was discovered in 1947 by palaeontologists Dr. Robert Broom and John Robinson. The skull was encased in breccia in the Sterkfontein Caves. Controversy surrounds whether Mrs. Ples is actually Mr. Ples and the debate concerns the tooth sockets and canine teeth of this 2.5 million-year-old *Australopithecus africanus*.



DESPITE GEOLOGISTS
CALLING FOR THE
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THE MINERS DYNAMITED
THE CAVES IN THEIR
SEARCH FOR LIMESTONE



General view of Little Foot skeleton in its original position in Sterkfontein cave, November 2006.

In 1983, Professor Yoel Rak from Tel Aviv challenged Broom's initial assumption that Mrs. Ples was a female. The skull's teeth sockets had been damaged by the acid used to clean it, which could have eroded the sockets to a smaller (female) size. University of Witwatersrand researchers, including Professor Francis Thackeray, compared the Ples skull with 12 other specimens of *Australopithecus africanus* from Sterkfontein and came to the conclusion that Ples is indeed a mister.

LITTLE FOOT: A GIANT FOOTPRINT FOR MANKIND

Boxes of deposits containing fossils from the Sterkfontein Caves are being stored at the University of Witwatersrand. While sorting through these boxes one day in 1994, Professor

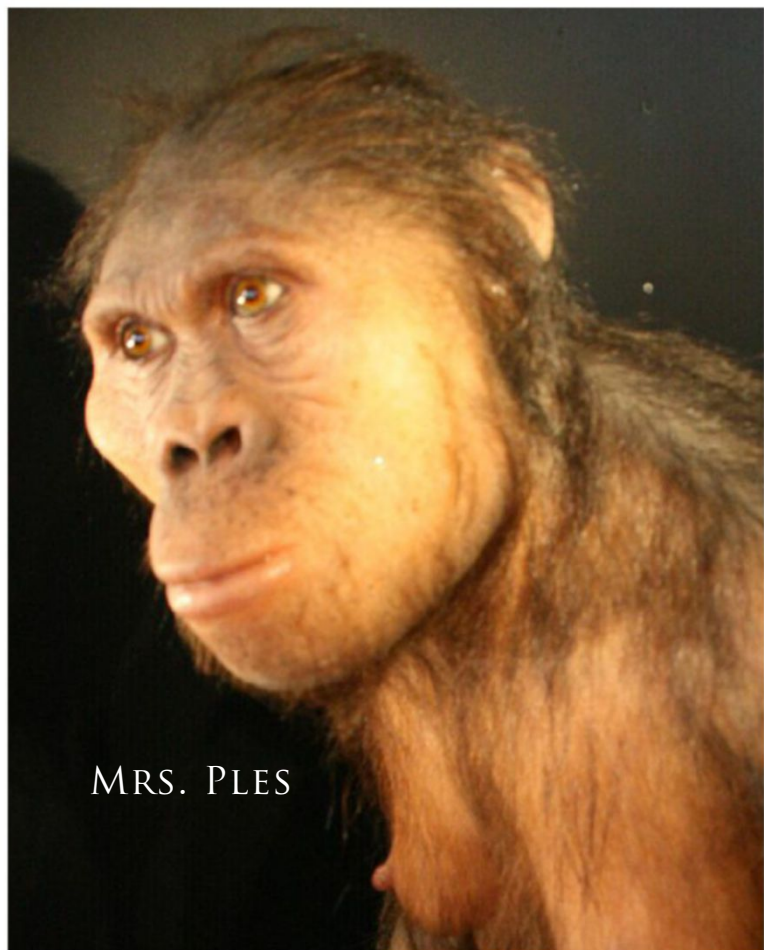
Ronald Clark recognized four *Australopithecus* foot bones. In 1997 he discovered more foot bones and a broken leg bone in another box. Clarke realized he had two feet and a piece of leg, which opened up the possibility of a full skeleton still embedded in the cave. He requested his two technical assistants, Stephen Motsumi and Nkwane Molefe to search the dark cave and within two days they came up with the matching leg bone. The search was on for the skeleton of Little Foot and it paid off at the Member two deposit, called the Silberberg Grotto. Much damage was done to the skeleton when it had collapsed into a cavity and rocks had tumbled on to the bones, but the skeleton had been mummified and calcified sediments had preserved it. It took Clarke and his team 14 years to painstakingly release Little Foot

from her rock tomb with an aircscribe vibrating needle, and another six years to clean her up and reconstruct her. Finally, in 2017 she was revealed and exhibited to limited audiences.

Like Mr./Mrs. Ples, there is also a controversy surrounding this find; this time regarding the age of the fossil hominid. In 2007, Clarke called in the expertise of Laurent Bruxelles, a karstologist and geoarchaeologist, French member of the National Institute for Preventive Archaeological Research (INRAP) and researcher at the French Institute of South Africa (IFAS), to unravel the dating of Little Foot. Together with his colleagues, they proved that the partial collapse of the cave left voids that were later filled with stalagmitic



flowstone which encased breaks through the femurs. Early attempts at dating the skeleton had relied on the stalagmitic flowstone, however since the flowstone was later introduced, the skeleton is therefore considerably older than the dated flowstones. Little Foot is thereby probably 3.67 million years old and not the two million years that has been claimed by other researchers. Clarke has concluded that Little Foot belongs to *Australopithecus prometheus*, a species named by Professor Raymond Dart in 1948, based on a fragment of a skull (MLD1) found at Makapansgat, whom Dart assumed had used fire. Is Sterkfontein, therefore, home to both *Australopithecus africanus* (Mr./ Mrs. Ples) and *Australopithecus prometheus* (Little Foot)? Again, this controversy is debated by the scientists who oppose Clarke's findings, arguing that Dart later retracted and settled that MLD1 belonged to *Australopithecus africanus*. They claim that according to formal taxonomic definition, *Australopithecus prometheus* cannot be scientifically distinguished from *Australopithecus africanus*, as required by the International Code of Zoological Nomenclature. The verdict is still out whether Sterkfontein is home to both, however, this does not detract from the significance of Clarke's meticulous work spanning two decades in freeing Little Foot from her cave and introducing her to a totally new world.



THE TAUNG CHILD – KILLED BY AN EAGLE

Mr./Mrs. Ples is related to another *Australopithecus africanus*, called the Taung Child. From being displayed as a monkey's skull on a fireplace to being described as "the most important anthropological fossil of the 20th century", the Taung Child has rocked the world of palaeoanthropology. In 1924, workers at the Buxton Limeworks discovered what appeared to be a primate skull at Taung, (250 miles from Sterkfontein, in the Cradle of Humankind) and presented the fossilized primate skull to Mr. E.G. Izod, director of the managing company of the quarry. The director passed it on to his son, Pat Izod, who displayed it on his mantelpiece. Josephine Salmons, a student of Dr. Raymond Dart at the University of Witwatersrand spotted the skull and soon a box of fossilized skulls was analyzed by Dart, who named the skull the 'Taung Child' and described it as "an extinct race of apes intermediate between living anthropoids and man". Dart at first was vilified for daring to suggest that humankind could have originated in Africa, but his successors, including the famous Professor Phillip Tobias, later acknowledged that Dart was right. The Taung Child is estimated to have been about four years old when it died and according to paleoanthropologist Dr. Lee Berger, it was probably killed by an eagle based on the talon marks in the eyes and a depression along the skull that is common in creatures that have been preyed upon by an eagle.

HOMO NALEDI, THE RISING STAR

By far the youngest inhabitant of the Cradle of Humankind thus far is *Homo naledi*, dating to a mere 335 to 236 thousand years ago. *Homo naledi* has traits similar to the genus *Australopithecus*, mixed with traits more characteristic of the genus *Homo*. Her hands are much smaller than Little Foot's and closer to the size of human hands. She may be contemporary with larger-brained anatomically modern humans like Neanderthals and Denisovans. Professor Paul Dirks of James Cook University, Australia and the Evolutionary Studies Institute and the National Centre for Excellence in Paleosciences, University of the Witwatersrand, headed the study on the age of *Homo naledi*.

Homo naledi was discovered in 2013 by recreational cavers Rick Hunter and Steven Tucker in the Dinaledi chamber of the Rising Star complex, situated about 1.36 miles west of Sterkfontein Caves.



TAUNG CHILD

HOMO NALEDI



Steven and Rick immediately contacted Professor Lee Berger of the University of the Witwatersrand, who led the excavations and in 2015 finally proposed that the bones represent a new *Homo* species. In a chamber adjacent to Dinaledi called Lesedi, scientists have found 'relatives' of *naledi*, namely the remains of a child and the partial skeleton of an adult male, who has been named Neo.

What makes *Homo naledi* so special is the speculation that since there is no evidence that the bodies landed in the cave due to a catastrophe, they could have been deliberately placed there, which would indicate a rite of burial and ritual behavior. As with the other controversies, the verdict is still out and the greater Cradle of Mankind has gradually and painstakingly been revealing its secrets of our ancient origins, which it has guarded for millions of years. ■



Little Foot fossilized skeleton
in a glass case. | Photo ©
Micki Pistorius (Digitally
enhanced for clarity)

MYSTERY, DANCE

EXPLORING THE TAYOS CAVE SYSTEM OF ECUADOR

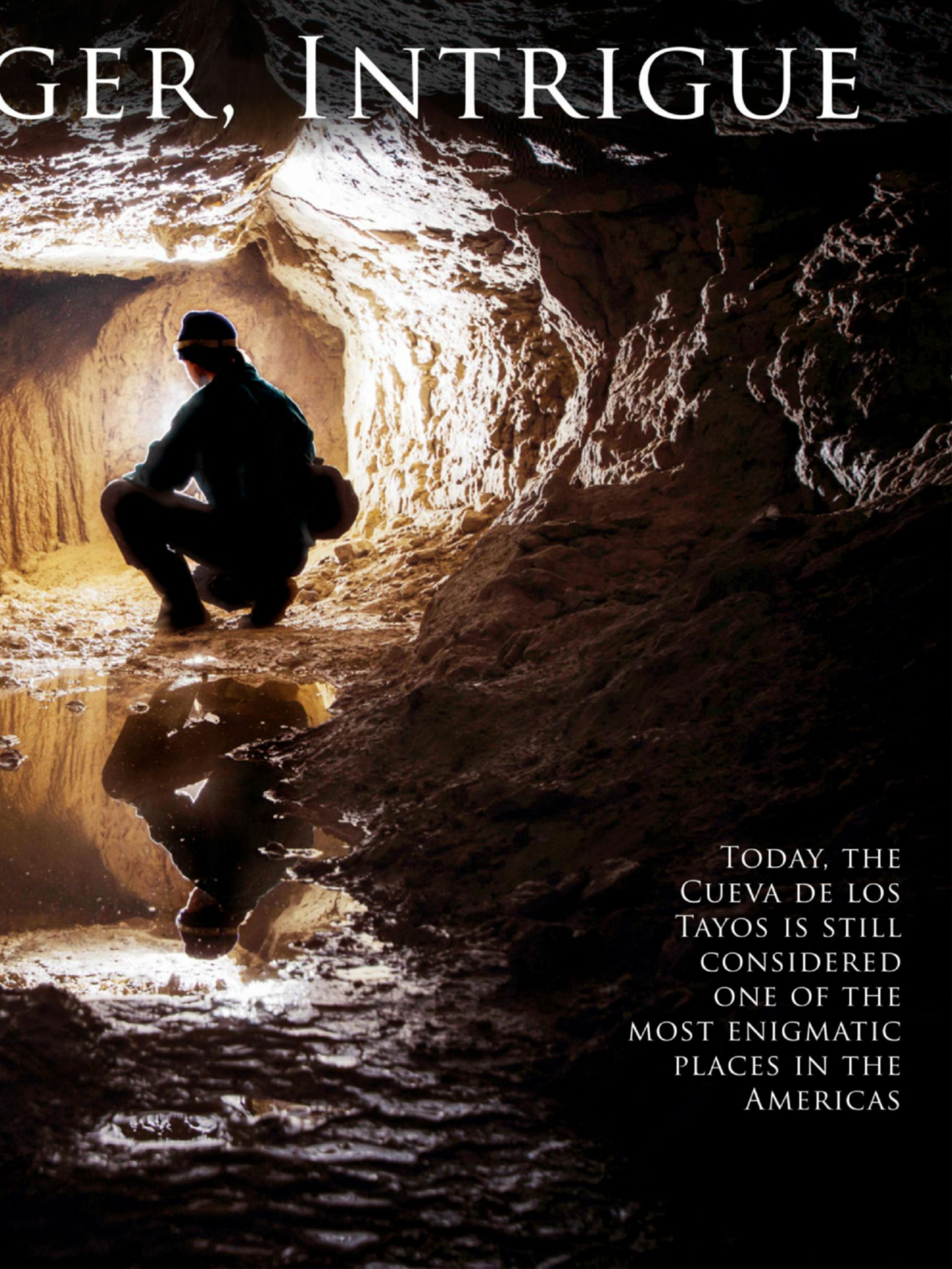
BY ALICIA MCDERMOTT

THE Tayos cave system of Ecuador is a vast natural underground network which has largely been unexplored. While written references to the caves only date back to around 1860, the indigenous Shuar people have inhabited the region since pre-Inca times. And they believe their ancestors were protecting the land for much longer.

Today the Cueva de los Tayos (Cave of the Tayos, named after the Tayos oilbirds that live there) is still considered one of the most enigmatic places in the Americas. Legends tell of a lost metal library, gold, giants, and manmade underground constructions. Much of the mystery may have to do with the fact that the Shuar ownership of the land means that the only way to explore the region is with their permission – something that many people have been afraid to request.



GER, INTRIGUE

A person wearing a headlamp and a backpack is crouching in a dark cave, looking into a brightly lit opening. The cave walls are rugged and textured, and the floor is wet, reflecting the light from the opening.

TODAY, THE
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LEGENDS AND HISTORY OF THE TAYOS CAVES

The unapproachable reputation may be unfounded, we found the Shuar guides and hosts in the little village we stayed at near the Pastaza river to be very welcoming and kind.

Nonetheless, most of the entrances to the Tayos caves involves the need to abseil down a large drop - another reason they are rarely explored.

For the Shuar, the caves have long been a location to obtain a favored food – the Tayos birds – and also a center for spiritual and ceremonial practices. They are also the home to powerful spirits in the Shuar belief system - and tarantulas, scorpions, spiders, and rainbow boas.

The Shuar are members of the Jivaroan peoples, Amazonian tribes living between the upper mountains of the Andes and the tropical rainforests and savannas of the Amazonian lowlands in Ecuador extending to Peru.

In some of their legends, they discuss having lived alongside an ancient race of “very tall, pale-skinned people” who were kind and sometimes referred to as members of the ‘spirit world.’ Some stories have linked the cave system with these beings. While experts have found artifacts which suggest an ancient unknown population was living in the area around the caves perhaps as far back as 1500 BC, the tales of giants may just be added to the Shuar myths for creative or symbolic reasons.

The Confederation of Indigenous Nationalities of Ecuador estimates that indigenous peoples comprise somewhere between 25 and 30 percent of the total population and include 14 distinct indigenous groups, of which the Shuar are one. There are about 40,000 Shuar people remaining in Ecuador today.





The Pastaza River, Ecuador.

GOLD OF THE GODS

The Tayos caves received worldwide attention in 1973 when Erich von Däniken released his bestselling and controversial book *The Gold of the Gods*, in which he claimed that Argentinian-Hungarian entrepreneur Juan Moricz discovered gold, unusual sculptures, and a library of metal tablets in a series of artificial tunnels within the caves. Tayos was also mentioned as the location of Father Crespi's collection of mysterious golden artifacts, said to have been given to him by the Shuar and other indigenous people of Ecuador.

In 1976, the largest and most expensive exploration of the Tayos cave system was launched, led by Stan Hall and involving over a hundred

people, including British and Ecuadorian military personnel, expert cavers, as well as Neil Armstrong. Numerous archaeological items of ancient origin were recovered in the caves, but nothing that matched the description of the treasures of von Däniken's book. The Shuar people stated they had investigated the wrong cave and the location of the treasures was a secret.

More recent expeditions have resulted in fascinating zoological and geological discoveries, but there's still no sign of a metal library. Yet the legends and fascinating stories of the Tayos caves are alive and well, intermittently drawing in more curious explorers...and that's where Ancient Origins comes into the story.

WHERE AND HOW TO SEARCH? MAKING CONTACT, BUILDING TRUST

In Stan Hall's book *Tayos Gold*, he recollects conversations he had with a man named Petronio, said to be one of the few people to have actually entered the famed metal library of Tayos. From the clues Petronio gave him, Hall decided that the real location of the metal library and the artifacts of Father Crespi are near a river (which he believes is Pastaza) and he says you have to dive underwater to find the entrance.

As the truth behind the Tayos caves has remained out-of-reach, Ancient Origins set out on their first expedition to the caves in 2015 to see just what lay within this enigmatic subterranean world.



Ioannis Syrigos, Gary Manners, and Christian Aguilar in the lodge, embarking on the first Ancient Origins expedition. | Photo © Ioannis Syrigos

It didn't take long before the first team that set out that Ioannis Syrigos, co-founder of the site, and staff members Gary Manners and Christian Aguilar discovered that organizing a real expedition to Tayos wasn't going to be so easy.

Sure, there are a handful of expensive trips that can be arranged to what locals refer to as the 'tourist cave,' but gaining access to the location Ancient Origins set their sights on was a different matter. The best method of action? Get close to the search area and hope for an invitation from the local Shuar people.

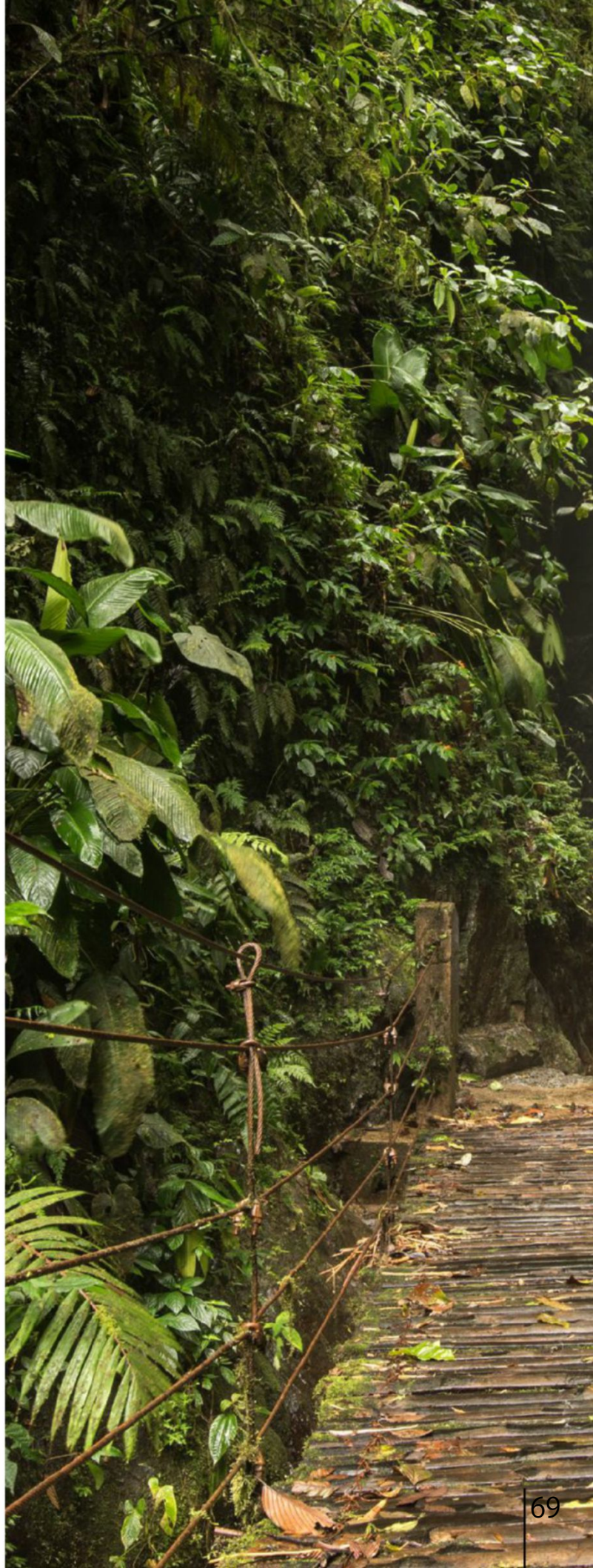
So, the three adventurers set off from Cuenca in the south of Ecuador to the country's North West near the city of Macas. Once there, they contacted government officials to obtain the necessary permits to enter Shuar territory. But they were surprised to discover that the only permission they needed to obtain was verbal permission from the indigenous owner of the land.

From there, the team made contact with an indigenous Shuar woman running a restaurant in town. She told them that her 7-year-old son Miguel would guide them one hour through the forest to one of the Shuar communities, where her father Luis would be able to provide guidance and lodging.

Luis explained more about the legends and myths behind the caves, including the story of Father Crespi and how gold and artifacts were indeed taken from the caves to be given to Father Crespi. While most accounts say that Father Crespi was given the artifacts in gratitude for his work with orphaned children in Ecuador, Luis referred to Father Crespi as a 'thief.' Luis also said that helicopters came and carried gold from the caves back to Crespi, and he claimed that the gold in the central cathedral of Cuenca, where Crespi resided, is from the Tayos caves.



Our three young guides, who led us to the river Pastaza.
| Photo © Ioannis Syrigos



During that first trip, Ioannis, Gary, and Christian explored several parts of the underground system, but they were told by Luis that one of the paths was 'prohibited' because the Shuar people living in the village had discovered footprints one day there...but the tracks had mysteriously disappeared by the following day. The Shuar believed these footprints belonged to the spirits and therefore they should not enter. The three travelers were granted permission to explore the path if they wished, but their local guides stayed behind. The most important aspect of that first expedition to Tayos was arguably the time spent building trust with the Shuar community. The Shuar have been exploited numerous times, so protecting their land and their history is of great importance. By building a strong relationship with the Shuar, Ancient Origins was invited back for further explorations.

ANCIENT ORIGINS RETURNS TO THE TAYOS CAVE SYSTEM

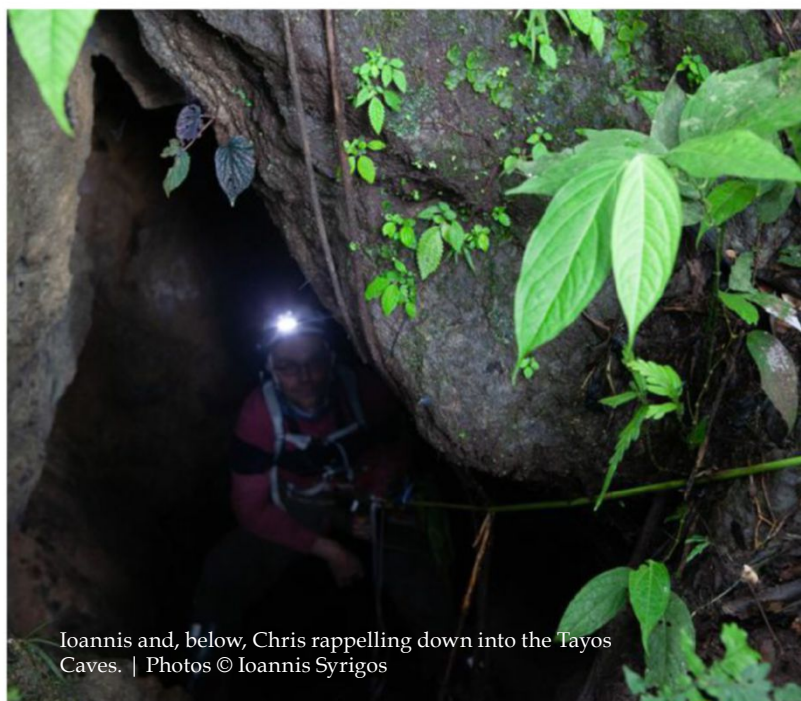
Ancient Origins returned once again to explore the Tayos caves in 2016. While the search for hidden cave entrances continues even today, our more recent expedition also demonstrated that the secrets of the area may go beyond the caves and tales of Father Crespi and his mysterious treasures...

This time, the explorers were Ioannis and me for Ancient Origins and two intrepid members of the Ancient Origins' Premium website named Scott and Wendi, who were ready and willing to take on the excitement and dangers of searching the jungle and the Tayos caves.

Bats, birds, snakes, wasps, and many other creatures kept us company throughout our time in and around the village and caves. Some of them caused a fright and others left some nasty red welts, but most just seemed to cast a curious eye over what we were doing on their land.

In the caves, we were met with the screeching of the distressed oilbirds who seemed none too keen on our bright lights and movements. While somewhat unnerving at first, their otherworldly noises may also provide some explanation for why the Shuar people believed that spirits could be found within the caves and would not enter some tunnels.

Wading, swimming, climbing, slipping, falling,



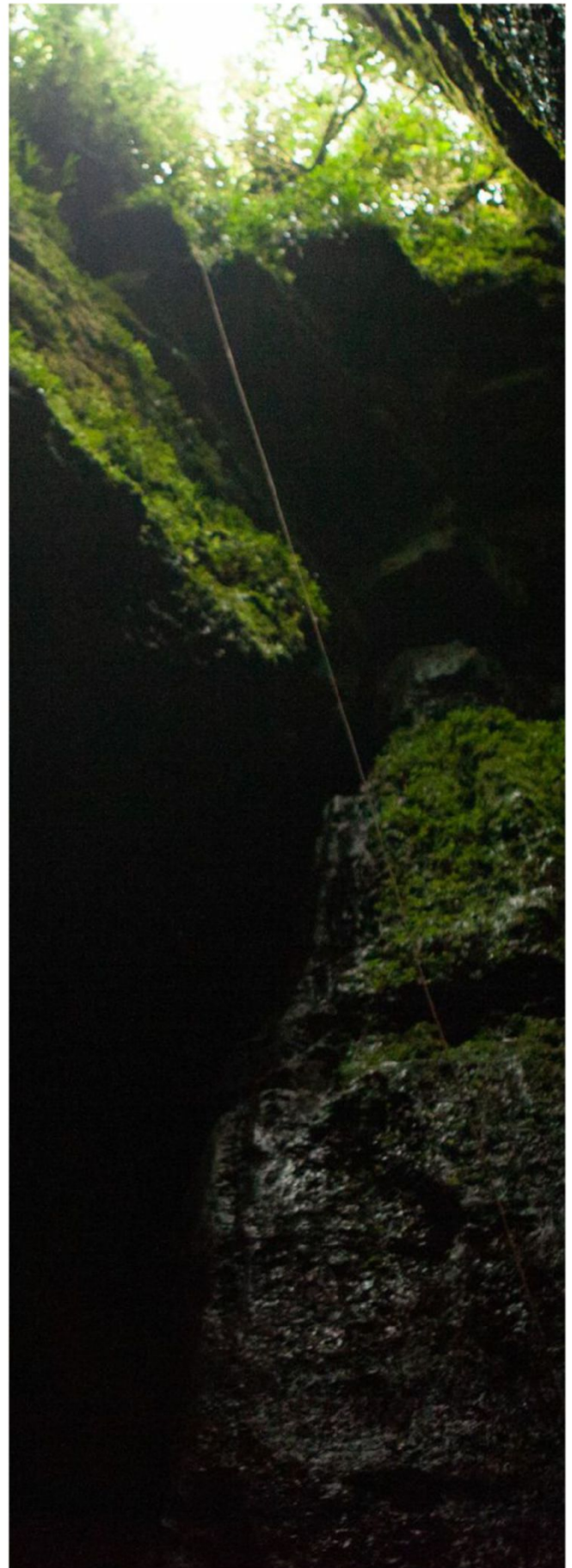
Ioannis and, below, Chris rappelling down into the Tayos Caves. | Photos © Ioannis Syrigos





scraping, and bruising our way through the underground labyrinth to finish off the cave that had been partially explored on the last expedition – it felt like we were in a foreign world. We didn't find any traces of treasure, but we did come across some possible stone tools while we journeyed the subterranean depths.

On our way back along the rocky riverside, we paused for a breath only to find ourselves alongside some strange-looking rock formations. The way they were laid out it seemed that we were walking alongside ancient stone walls! Even more strange were the projecting rocks at the base of some of the megaliths – those additions almost looked like toes. We couldn't find any entrances to squeeze through or any clear archaeological material suggesting the rock structure's possible purpose or a concrete explanation for its creation.



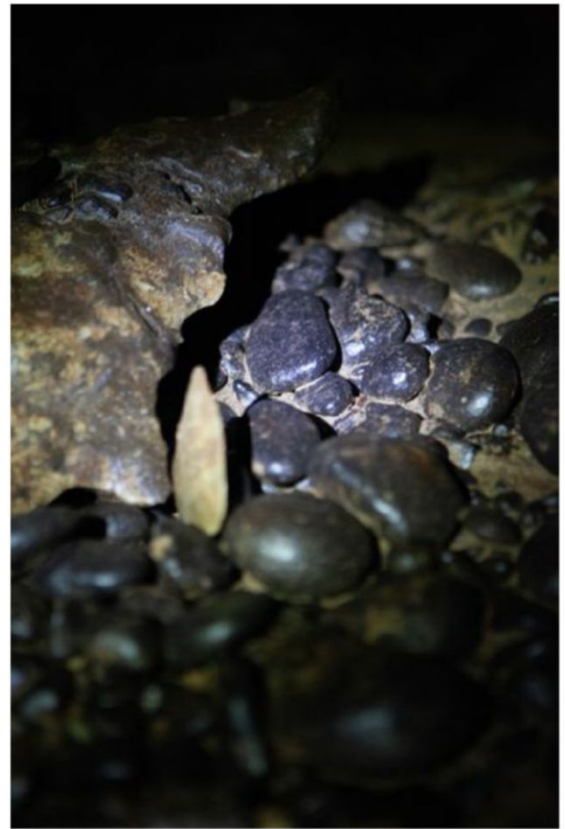
Was it man-made or natural?

To find out more, the team split into two groups and we hacked our way through the brush to climb up and over the apparent “wall” of giant rocks, but we still found no entrance or proof if the megaliths had been placed in their seemingly well-organized manner intentionally. Without other tools, we were unable to see past or under the large stones. So, their origins remain uncertain.

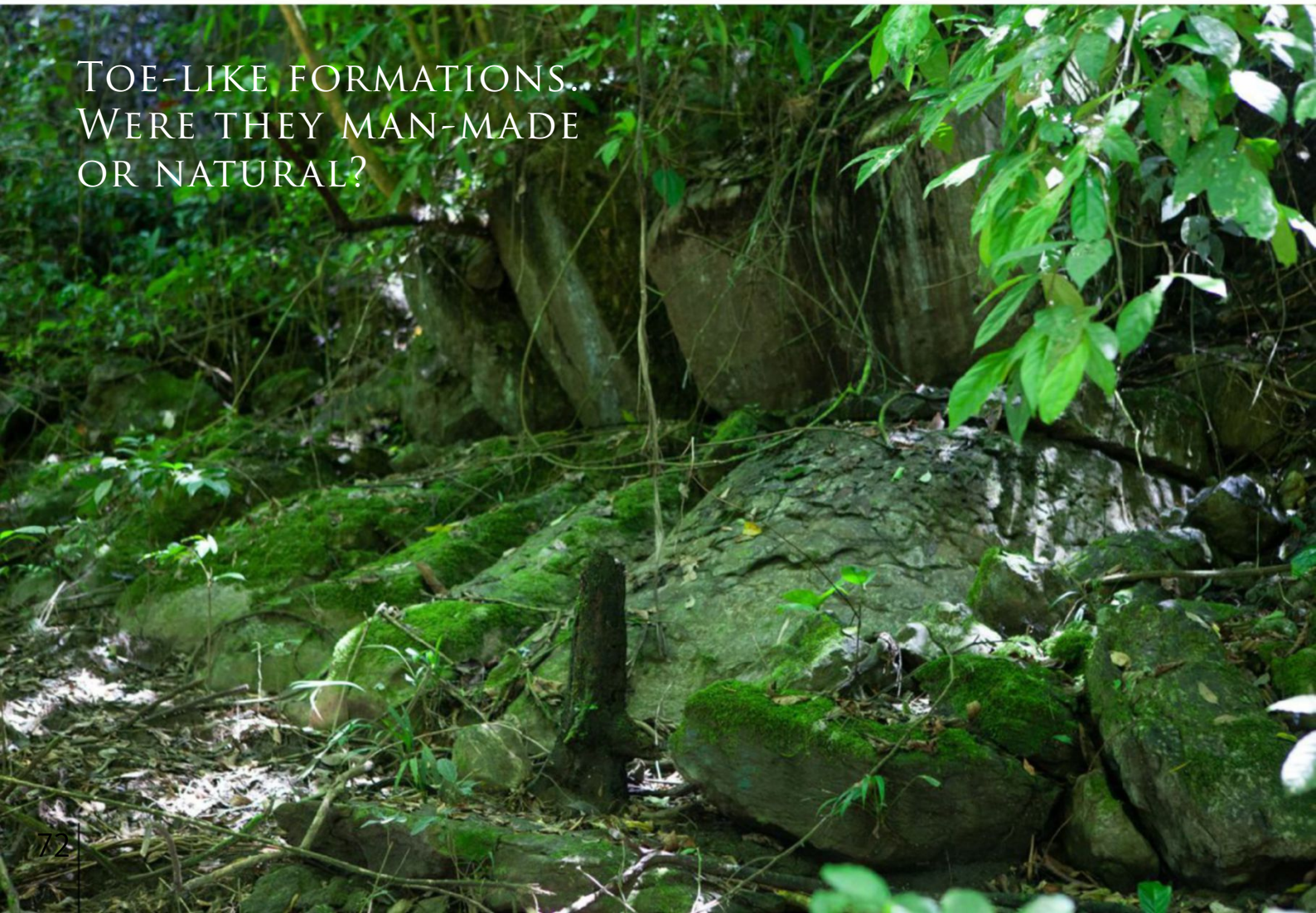
And while we explored the area around these rocks we came across at least five more possible cave entrances hidden among the brush. And those new Tayos cave entrances are still awaiting exploration as the nearby rock structure continues to beckon with its mystery. What secrets does this fascinating region still hold and when will they be revealed?

Our time exploring Tayos was an experience to remember - and lucky for me, this September I have the opportunity to return to the underground world once again. This time I'll be accompanying a larger Ancient Origins expedition with several of the members of the Premium site to further explore entrances into the enigmatic cave system and maybe even gain a peek at the remnants of a lost jungle city. ■

Right: The assemblage of rocks with one possible stone scraper.
Below: 'Toes' seen at the base of the rock structure.

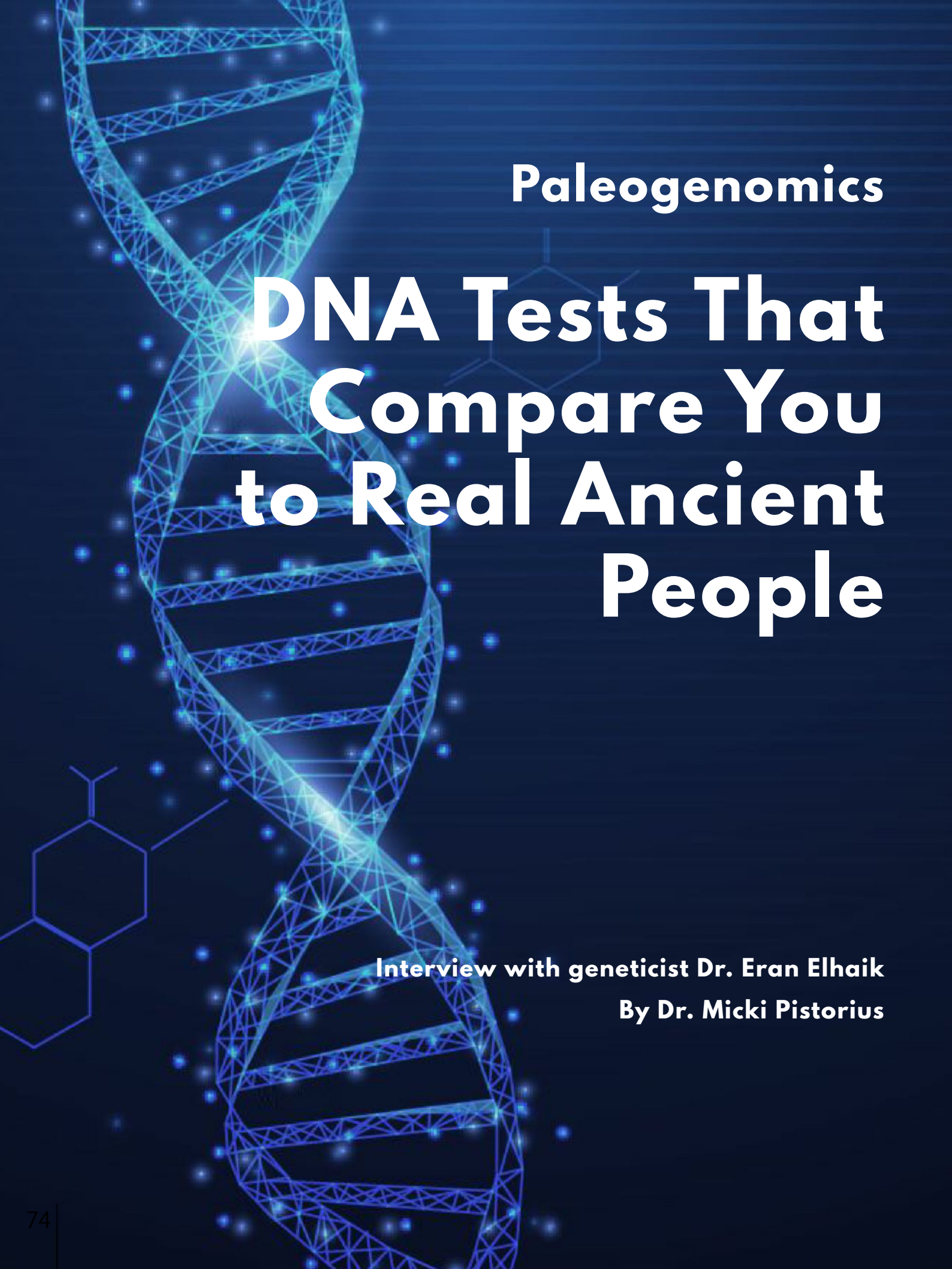


TOE-LIKE FORMATIONS..
WERE THEY MAN-MADE
OR NATURAL?





Above: Members Wendi and Scott examining the rock formation. Left: General view and detail of the large rock structure we encountered on the expedition. | Photos © Ioannis Syrigos



Paleogenomics

DNA Tests That Compare You to Real Ancient People

Interview with geneticist Dr. Eran Elhaik

By Dr. Micki Pistorius

**Are You
related to
Ötzi the
Iceman...
a Roman
Gladiator...
or even an
Egyptian
Pharaoh?**



Dr. Eran Elhaik, a geneticist for University of Sheffield and expert on paleogenomics, has made world history by developing the first DNA test to compare a modern-day person's DNA to that of ancient people who lived thousands of years ago.

MP: Can you please explain to us what makes your DNA test different from the current genealogy DNA tests available on the market? How does the GPS Origins test differ from the Primeval DNA test?

EE: Ever since the first human population genetics studies in the mid-1960s, geneticists have been concerned with measuring genetic distances between populations to study their origins. It took the technology another 45 years to be applicable to ancient DNA extracted from skeletons. GPS Origins compares ancient people to modern-day people to infer their recent geographical origins. This is the only genetic test that provides recent migration routes. GPS Origins was very useful in helping people connect with their parents, grandparents, and great-grandparents, but the test could not make geographical predictions beyond 1,000 years on average. This is due to the reliance on modern-day populations, whose recent migrations blurred their more ancient origins. The problem with using modern-day populations to make inferences about the far past is common to the entire genetic genealogy industry that pretends that modern-day populations are a replica of the past, when we all know very well that they are not. The Primeval DNA Test is the first test to break this barrier by using ancient DNA from skeletons and mummies that are hundreds, thousands, or tens of thousands of years old from all over the world. This test allows anyone to compare themselves directly to real ancient people, one to one, without a priori assumptions. This was made possible by our identification of a new type of mutation that exists both in ancient and modern-day populations that increases the accuracy of the results.

Please tell us more about the seven groups people can compare their DNA to.

First, we have 12 groups now, and by the time of the interview, I expect this number to be close to one hundred. Due to the high demand for the test, we developed a new dedicated website that can handle a large number of tests: (primevaldna.com). The current 12 tests include: 1) Vikings in Medieval Iceland; 2) Ancient Israelites; 3)

Ancient Britons of Roman England; 4) Egyptian Mummies; 5) Chumash Paleo-Indians; 6) Stone Age Europeans; 7) Ice Age Europeans; 8) Mal'ta Boy; 9) Anglo Saxon Fen Dwellers; 10) Ötzi the Ice Man; 11) Kennewick Man; 12) Minoans and Mycenaeans. Each group consists of at least one and in some cases up to 20 skeletons, each with their own unique story. The user can learn about their genetic similarity to each skeleton and then interactively compare their results with modern-day worldwide populations.

How many samples of the ancients have you collected and how did you actually find them and identify them as suitable 'candidates'?

Thus far, all the data was collated from the literature, but I am also active in generating my own data from archaeological sites. We have genomic data from nearly 3,000 ancient people. We have extensive quality control procedures to decide whether DNA from a skeleton can be included in the test, which depends, among other things, on the technology used to date them and the overall ancient DNA quality, because if we are uncertain of the era the skeleton dates from and the DNA quality is poor, then we cannot tailor the right story and the results will make little sense.

How much do you know about the ancient individuals whose DNA you hold – the type of life they led, the circumstances of their death etc.?

One of our main aims is to find out all we can about each person and tell their story. We want to know their lifestyle, what they ate, who they worshipped, what their occupation was, what diseases and disorders plagued them, and how they died.



Reconstruction of Ötzi the Iceman mummy as shown in Prehistory Museum of Quinson, France.

120/CC BY SA 3.0



We want to know what they looked like and how well they were adapted to their environments. We want to know where they came from, what their culture was, and what language they spoke. To answer all these questions, we need to gather data from multiple fields and carry out multi-OMIC analyses. Of course, we may not be able to answer all these questions. If the genes that encode eye color did not survive the passage of time, the ancient DNA would have a hole in their locations and we will never know the eye color of that person, but we hope to get an idea of the eye colors of other members of the group whose eye color genes were better.

Is it difficult to extract DNA from ancient skeletons or mummies? What problems have been encountered in the process?

Yes, it is. The DNA is a very strong molecule, it has to be since nature chose it to be the primary molecule of almost all life on the planet, but it is not indestructible. Heat and humidity are the enemies of the DNA molecule and they expedite its degradation and break it apart beyond our ability to put it back together. Think about a Lego house. If you know what a house looks like and you were given two pieces; one of a house and one of a roof, you will not have any problem to put the roof on top of the house

and reconstruct it. But if you had only small bricks, you would not be able to put together the house as it was. This is the case with ancient DNA and once the segments become too short the information is lost forever. Even reconstructed ancient DNA does not look like the original DNA because it still contains partial information, holes, and errors.

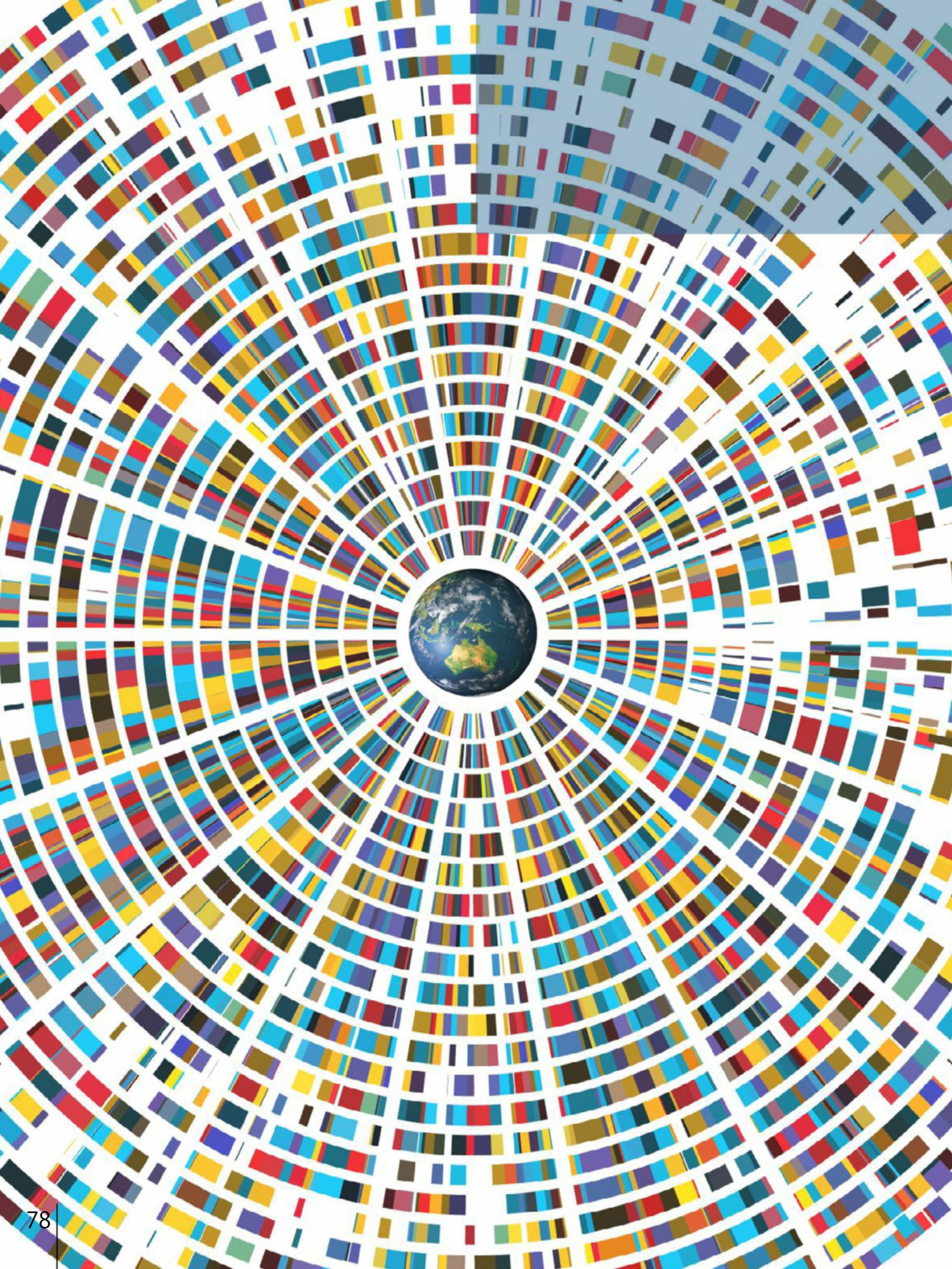
Our challenge is to develop complex genetic models to overcome these limitations.

What are other groups of ancients that you are hoping to include in your research in the future?

There is a growing list of candidates chosen carefully based on our assessment of the demand, that is, what people would find interesting. It is a major challenge because most of the populations that we have predate the written word and people would naturally be less familiar with their culture.



Engraving of a mammoth on a slab of mammoth ivory, from the Upper Paleolithic Mal'ta deposits at Lake Baikal, Siberia





To allow everyone to connect with their past we strive to include ancient people from all over the world

I did not study the Bell Beakers, Scythians, or Ice Age Europeans at school. In Israel, the focus is on Middle Eastern populations with bits on Greeks and Romans. The English would probably know a lot more about the populations who entered or invaded Britain around and after the first millennium, but they might not know about the Bell Beakers either. The ultimate decision whether to produce a “popular” or an “educational” test is whether we can say something interesting about this culture that would allow people to relate to them despite the passage of time. As such, we aim to include populations mentioned in the Bible, like the Judaeans, Canaanites, and Scythians as well as prehistoric Britons. To allow everyone to connect with their past we also strive to include ancient people from all over the world like Zulu and Chumash Paleo-Indians.

Surely some of your work must have created much controversy. Can you tell us more about your research findings on the Ashkenazi Jews for example?

True work of science is almost always controversial and when one strives to do original groundbreaking work, controversies are unavoidable. The origins of

Ashkenazic Jews and their native language, Yiddish, have been debated for over three centuries, first by linguists, then historians, and now geneticists. Because these questions tie into many other fields and have political, religious, and commercial importance, they are highly controversial to begin with. The end goal of most of the research is to link modern-day Jews (primarily Ashkenazic Jews) to the Biblical Judaeans, historically, linguistically, and genetically; however they were never able to overcome the contradictions created by their work. To name a few: if the vast majority of Judaeans were never exiled from Palestine, who established the European diaspora? If Eastern European Jews numbered only 50,000 in the 15th century, how could they have accounted for five million Jews by the 19th century? How do we explain the genetic high similarity of Ashkenazic Jews to Greek and Caucasus populations and their lack of similarity to native Levantine populations? Why does Yiddish sounds like broken German?

To answer the questions of the origin of Ashkenazic Jews and Yiddish, I applied a tool developed at my lab called GPS which converts genetic to geographic information most accurately.



GPS pinpointed Ashkenazic Jews to a region in northeastern Turkey, which is on the crossroad of the Silk Route and harbored four primeval villages whose names derive from the word “Ashkenaz.” This is the only place in the world that has place names that derive from Ashkenaz. We concluded that the Ashkenazic Jewish genome is a conglomerate of Greco-Roman-Turko-Irano-Slavic and perhaps Judaeen genomes from various pagan populations that lived on the shore of the Black Sea and became god-fearers, probably around the first century AD. We already know that, after encountering Irano-Turkish Jews, they accepted the doctrine of Judaism to the extent that they created at least two translations of the Bible into Greek during the first and second centuries. These people were also experienced maritime merchants who may have considered the mutual advantages of forming an alliance with the Irano-Turkish Jews. Yiddish languages (there were at least three) then developed as secret languages to control trade, which was a Jewish monopoly. These Jews had reached the North Caucasus and influenced the religious conversion of Khazaria to Judaism and from there they reached Eastern Europe between the 10th and 13th centuries. They also entered southern Europe from Turkey around the 10th century. At that point, Yiddish began absorbing German words, but due to its Slavo-Irano-Turkish basis, it sounded like broken German. Our findings provide coherent and simple answers to the origin of Ashkenazic Jews and Yiddish without resorting to creationism, while at the same time refuting some of the dogmas that underlie linguistics, genetics, and history.

Since that study was published, ancient DNA data from various regions came to light which corroborated our findings as to the Western Asian origin of Ashkenazic Jews.

What is your opinion on the revival of extinct species, such as the mammoth or the dodo?

De-extinction is futile, wasteful, and fraught with ethical and practical problems. Where would those mammoth live? Selective breeding is faster and cheaper, but again, to what purpose? Is showing a zebra with an odd stripe pattern, as in the case of the quagga, worth the effort? Resources should be allocated to conserve extant species and protect their environments. ■

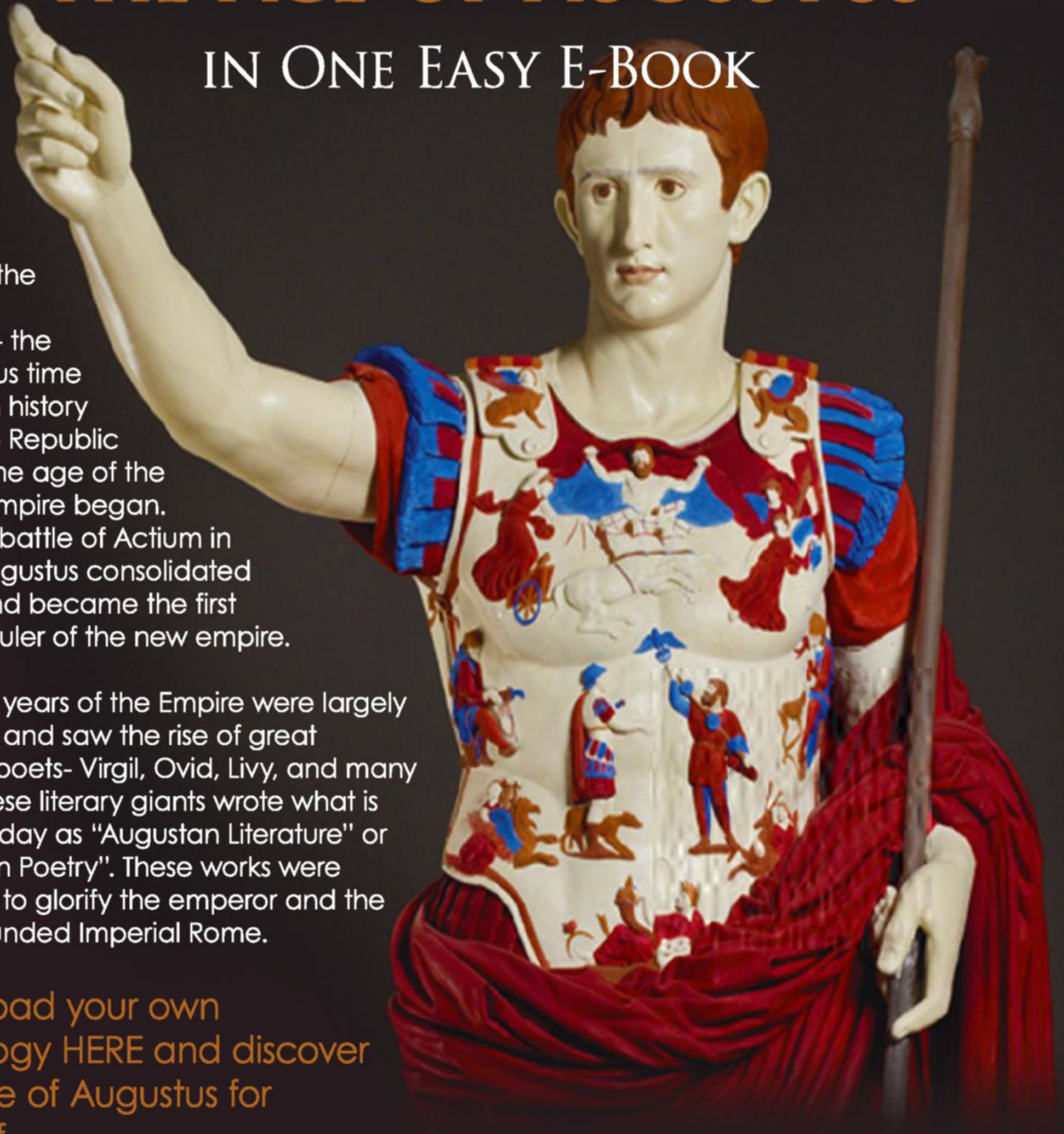
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Mar Saba Monastery

The Kidron Valley between Old Jerusalem and the Dead Sea is home to the Mar Saba monastery. A young Syrian-Cappadocian monk, Sabbas became a pupil of the monk Saint Euthymius in Jerusalem. At the age of 30, Sabbas was permitted to spend five years in isolation in some nearby caves, where he made a series of caves into a lavra, consisting of several cells with a church at the center. Soon, young monks who wanted to learn monastic values joined him. This led Saint Sabbas to found the Mar Saba monastery in 483 AD.

It was attacked in 614 AD by the Persians and 44 monks were killed, becoming the first martyrs associated with the monastery. It was looted in 796 AD and attacked again in 809 AD and 813 AD. During the 12th century, the Crusader kings became patrons of the monastery. After the fall of the Crusader Kingdom of Jerusalem in 1187 AD to Saladin, the Monastery fell into neglect, though it continued to be used.

Roman | AdobeStock







16TH CENTURY DERANGED SERIAL KILLER OR VICTIM OF BETRAYAL?

BY JOANNA GILLAN

THE BLOOD COUNTESS



COUNTESS Elizabeth Báthory de Ecsed (Báthory Erzsébet in Hungarian) is recorded as one of the most prolific serial killers in history, as documented by her entry in the Guinness Book of Records. She is estimated to have brutally tortured and killed between 80 and 650 young women between 1585 and 1610 AD. She was imprisoned in 1610 AD within Csejte Castle, now in Slovakia, where she remained immured in a set of rooms until her death four years later.

The gruesome tale of Elizabeth Bathory has become part of national folklore and the subject of numerous plays, books, and movies. She is often compared with Vlad III the Impaler of Wallachia, on whom the fictional Count Dracula is partly based, and has become known as The Blood Countess. But in recent years, the truth behind these tales has been brought into question and some scholars now argue that Elizabeth Báthory was no murderer, but rather the victim of political betrayal.



Elizabeth Báthory (1560 – 1614 AD) was a countess from the renowned Báthory family of nobility in the Kingdom of Hungary, and cousin of the Hungarian noble Stefan Báthory, King of the Polish-Lithuanian Commonwealth and Duke of Transylvania. She was born on a family estate in Nyírbátor, Hungary, and spent her childhood at Ecsed Castle.

At the age of 15, Elizabeth was married to Ferenc Nádasdy, the son of a Baron, in what was likely a political arrangement within the circles of the aristocracy. Nádasdy's wedding gift to Báthory was his home, Csejte Castle. However, only three years after their marriage, Nádasdy became the chief commander of Hungarian troops, leading them to war against the Ottomans, and in 1604 AD, Ferenc died at the age of 48, reportedly due to an unknown illness or a battle wound. During the war, and after Ferenc's death, Elizabeth was left to run the Nádasdy estate, including management of its defense, business affairs, and upkeep, which would have been no easy task. It was during these years that Elizabeth was said to have gone on a brutal killing spree.

LEGENDS OF THE BLOOD COUNTESS

The first account of Elizabeth Báthory's killing spree appeared in 1729 AD (more than a century after her death) in the book *Tragica Historia* by Jesuit scholar László Turóczi. According to Turóczi, Elizabeth would kidnap young peasant women from the nearby town or lure them to the castle with the promise of well-paid work, and would subsequently torture them to death through severe beatings, burning, mutilation, biting, freezing, or starving. She was then said to have ordered her slaves to gather their blood in buckets and fill a bath so that she could bathe in the blood of virgins to retain her youth.

Since this first publication, rumors and stories spread quickly throughout the country and abroad. Elizabeth was ascribed with vampire-like tendencies and was said to have bitten her victims and drunk their blood. The stories of her serial murders and brutality are said to have been verified by the testimony of more than 300 witnesses and survivors as well as physical evidence and the presence of horribly mutilated dead, dying, and imprisoned girls found at the time of her arrest.

There are many conflicting accounts regarding the number of women Elizabeth Báthory is said to have murdered. But according to another popular story, one witness reported that Báthory had a book where she kept a list of over 650 victims. The location of this supposed diary is unknown.

A woman in a dark hooded garment, possibly a nun, is shown from the chest up. Her right hand is extended forward, palm up, and is covered in bright red blood. The background is dark and out of focus.

ELIZABETH WAS
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Left: Ferenc Nadasdy I, husband to Elizabeth
Right: Historic portrait of Georg Thurzo, Elizabeth's accuser

5 PROLIFIC SERIAL KILLERS OF THE ANCIENT WORLD

Liu Pengli

aka the Prince of Jidong, is the first recorded serial killer. He was a 2nd-century-BC Han prince who murdered over 100 people, allegedly for sheer sport.



Queen Anula of Anuradhapura

was a powerful Sri Lankan queen who reigned from 47 to 42 BC. Anula poisoned her son and four husbands. She was eventually overthrown and burned alive.

Christman Genipperteinga

is widely considered the deadliest serial killer in recorded history. His diary outlines the gruesome details of all 964 murders he committed. He was condemned to death by the breaking wheel in 1581 AD.



Peter Stumpp

aka the 'Werewolf of Bedburg,' was a wealthy French farmer who murdered and ate 14 children (including his own son), and two pregnant women. Stumpp claimed he had been given a magic belt by the Devil which allowed him to transform into a wolf. He was executed in 1589 AD.

Doña Catalina de Los Ríos Lisperguer

aka 'La Quintrala,' was a 17th-century Chilean landowner who allegedly tortured and killed her father, her lovers, and hundreds of slaves. Her wealth and connections allowed her to avoid trial on 15 murder charges. She died, feared and mythologized, in 1665 AD.



INVESTIGATION AND ARREST

Before dying, Elizabeth's husband, Ferenc, entrusted his widow to György Thurzó, the Palatine of Hungary, who would eventually lead the investigation into Elizabeth's alleged crimes. After rumors of Báthory's atrocities had spread through the kingdom, Thurzó ordered two notaries to collect evidence in March 1610 AD, which supposedly included testimony from more than 300 witnesses (records actually show 13 witnesses). In December 1610 AD, Thurzó went to Csejte Castle and arrested Báthory. But he was faced with a dilemma – a trial and execution would have caused a public scandal and disgraced a noble and influential family, and Elizabeth's considerable property would have been seized by the crown. Thurzó successfully convinced King Matthias that bringing Elizabeth to trial would negatively affect the nobility, so the trial was abandoned and instead Báthory was imprisoned in Čachtice Castle. She was kept bricked up in a windowless room, with only small slits left open for ventilation and the passing of food. She remained there for four years, until her death on August 24, 1614 AD.

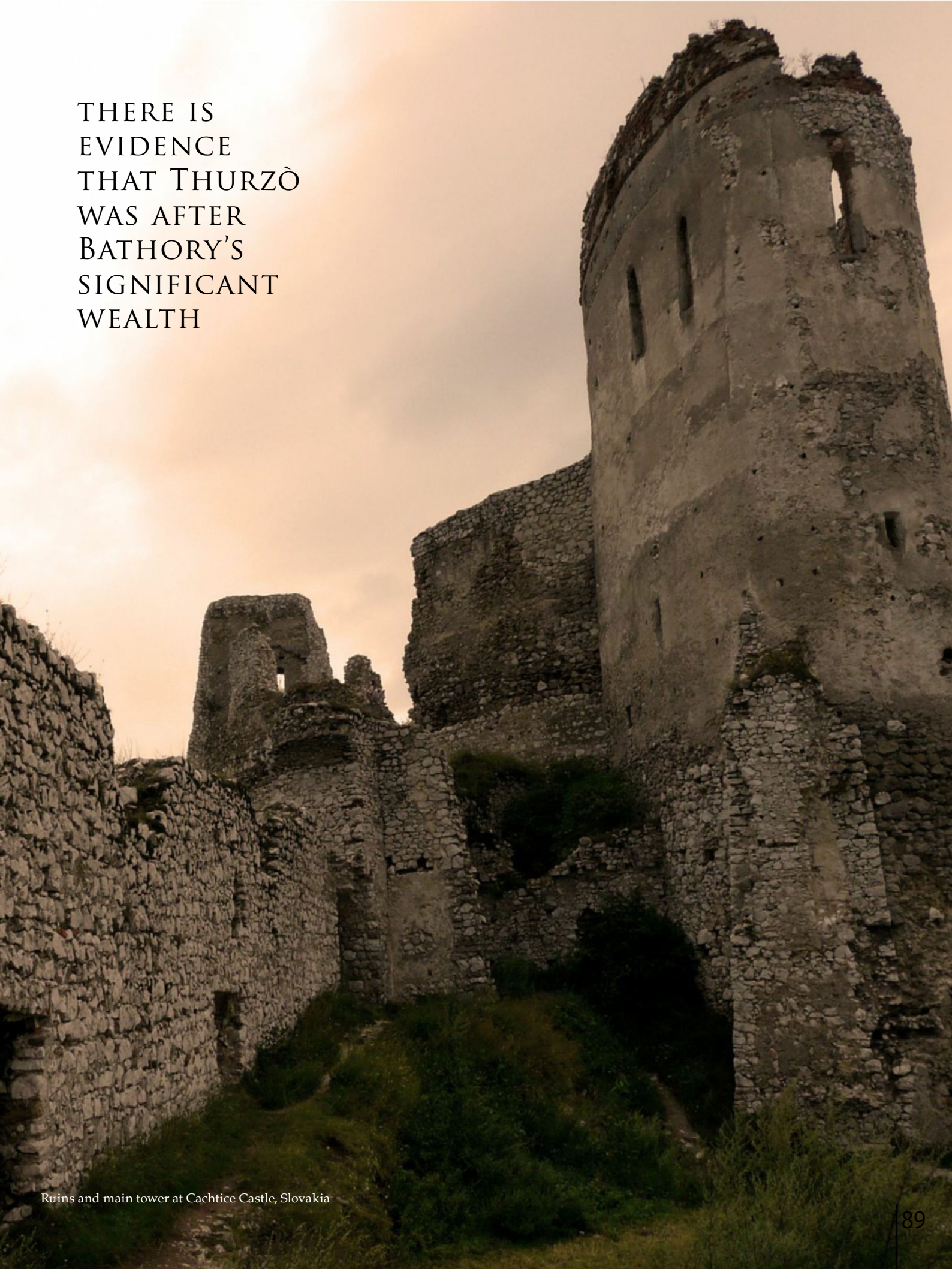
POLITICAL BETRAYAL?

In the last two decades, a number of historians, most notably Laszlo Nagy, have come forward to defend the name of Elizabeth Báthory, claiming that the accusations made against her were part of a cunning plan by Thurzó to imprison a bothersome political rival. A number of arguments have been put forward by those proclaiming Elizabeth's innocence.

Firstly, Thurzó took steps to imprison Bathory as soon as he became Palatine of Hungary, leading some scholars to suggest that this move was pre-planned. Thurzó had been assisting King Matthias in his efforts to extend his control over powerful Hungarian nobles and the Bathory family certainly fell into his category. It has also been said that there is evidence that Thurzó was after Bathory's significant wealth.

Secondly, King Matthias and the Imperial Family owed substantial amounts of money to the Countess, which they had trouble paying due to the lack of cash flow in their coffers, and this may have provided a motive to have her eliminated.

THERE IS
EVIDENCE
THAT THURZÒ
WAS AFTER
BATHORY'S
SIGNIFICANT
WEALTH



Ruins and main tower at Cachtice Castle, Slovakia



In addition, being a widow in charge of a large estate, Bathory could have been susceptible to rumors that she was involved in witchcraft. Scapegoating widows and accusing them of being responsible for natural deaths was common in Central Europe during this era.

It is impossible to know the true facts regarding Elizabeth's story as she was never given a trial and so there were no official records of the case. It is known that confessions from Bathory's alleged accomplices were obtained through torture, and they were subsequently executed. Elizabeth's supposed list of victims has never been found, nor have other key documents that could have shed light on the true facts. If there was an attempt made to frame Elizabeth for crimes she did not commit, the real motivation remains only a matter of speculation.

Overall, it is impossible to be completely confident in either proclaiming Bathory's innocence or her guilt. However, unless any further evidence emerges to completely free her of the accusations, folk legends and popular media will unfortunately ensure that she is forever remembered as the Blood Countess—one of the most brutal serial killers of all time. ■

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PUMA PUNKU Tiwanaku's Greatest Enigma

AT the end of the 46-mile journey from Bolivia's capital, La Paz - the highest city in the world - lies the huge, sprawling ceremonial center of Tiwanaku. The first site every visitor wants to see is the remains of Puma Punku, an ancient temple complex built in circa 536 to 600 AD, according to some archaeologists.

Originally excavated during the first half of the 20th century by Austrian-born engineer, navigator, and explorer Arthur Posnansky (1873-1946), the importance of Puma Punku's impressive array of cut and dressed stone blocks, many of them with multiple angles, was very quickly realized.

Posnansky included pictures of some of these stone blocks, some up to 130 tons apiece, in his four-volume work *Tiwanaku: the Cradle of American Man* (1945/1957). This, along with the fact that the Austrian also found reason to conclude that the true age of the Tiwanaku temple complex was somewhere in the range of 15,000 BC, later reduced to 9,500 BC under severe criticism from his peers, ensured that the existence of Puma Punku's stone blocks would come to the attention of a particularly wide audience - one that would see their existence as evidence of a lost technology present at Tiwanaku at the end of the last Ice Age.

When you arrive at Puma Punku, the first thing you are struck by is the fact that no buildings remain standing; all you see are scattered remains around the original floor plan of the temple and row after row of multifaceted blocks laid out like outdoor museum exhibits. Yet gazing upon them, the visitor is able to marvel and wonder at their individual uniqueness and brilliance. Indeed, I am sure that if you counted the multiple facets of many of the stone blocks, made both of red sandstone and of a hard volcanic rock called andesite, you would find that some of them have as many as 20 and possibly even 30 faces with equally as many angles. It is as if they are meant to come together to form some kind of giant prefabricated

building of the prehistoric age.

The question, however, is why? Why bother? Why create stone blocks with so many sides and angles, when more simple rectangular blocks would have sufficed to do the same job? There simply isn't any good reason to use such complicated, multifaceted blocks. They are entirely unnecessary and completely superfluous to requirements. And yet here they are, a surviving wonder of the ancient world that compels the imagination and begs explanation. What was it that made the people of Tiwanaku think this way when in virtually every other part of the ancient world our desire was for straightforward efficiency using stone blocks of more regular shapes and sizes?

There are no easy answers, other than to assume that the Tiwanaku culture had a very different mindset to that of the inhabitants of the western world. Whereas our own ancestors had a flair for precision and functionality in building construction, the Tiwanakans had an eye, some might even say an obsession, for aesthetic beauty, geometric perfection, and utter uniqueness, whatever the cost to the stonemasons involved.

This begs the question: Who were the Tiwanaku people, and where exactly did they come from? The clues lie on the ground, around the Puma Punku complex. Stone tools have been found entirely unlike those manufactured by modern humans in many parts of the Eurasian and American continents. Created in a style known as Levallois, they have more in common with the tools manufactured by the Neanderthals than they do with those of *Homo sapiens*, hinting that at Tiwanaku in the distant past there were human groups present with an archaic ancestry deriving either from the Neanderthals or from their sister group, the Denisovans, although how they came to be where they were in South America, and how they came to create Puma Punku, is a story that will have to wait until another day. ■

For more on the presence of Neanderthal and Denisovan hybrids in South America, as well as the savant-like traits of the Denisovans, see the author's new book Denisovan Origins, co-authored with Greg L. Little and published by Inner Traditions. Andrew Collins will be hosting tours to Peru and Bolivia with Ancient Origins in 2021. Watch out for details soon. | www.andrewcollins.com



Here they are, a surviving wonder of the ancient world that compels the imagination and begs explanation.



Levallois-style stone tools from the area around Tiwanaku's Puma Punku temple complex | © Andrew Collins 2019



Stone blocks on display at the site | © Andrew Collins 2019



The stone floor of the Puma Punku temple complex at Tiwanaku, built according to conventional thinking 536-600 AD | © Andrew Collins 2019

Make Your Own Kombucha

The Legendary Tea of Immortality

BY ALICIA MCDERMOTT



KOMBUCHA is a type of fermented tea which originated hundreds of years ago but has only recently become a global phenomenon. It is difficult to confirm exactly where kombucha first became popular, and there is much debate surrounding the question. Most people cite China as the probable homeland, possibly around 200 AD, although it's believed to have gained its name from a Japanese doctor who lived around 400 AD.

Stories say that Dr. Kombu presented the drink to Japanese Emperor Ingyō and both enjoyed it and noted its health benefits. As a result, the tea became popular throughout Japan, and it earned its name from Dr. Kombu, with the



suffix “cha” (the Japanese word for tea) tagged on to the end. The tea became popular among the Samurai, who would drink it to increase their strength and energy before a battle. It is likely kombucha was introduced to Russia at the end of the 19th Century when soldiers from China, Japan, Korea, and Russia were involved in territorial conflicts and mixed some cultural practices. By the 1900s, kombucha was being brewed over a wide area, including much of Russia, and it was being used by many as a folk remedy.

Kombucha spread further into Europe during WWI when a German scientist, Dr. Rudolf Sklenar witnessed Russian peasants using kombucha to aid wounded soldiers. He was intrigued by kombucha and its potential use as a treatment. After bringing it back to Germany he used kombucha in his treatment of cancer patients. Both Russia and Germany continued to use kombucha as a medicine throughout the early 20th Century, and a huge number of studies were conducted in an attempt to understand and verify the benefits of the

drink – many of these studies were focused on how kombucha could help with digestive problems and in managing diabetes. During WWII, when both tea and sugar were heavily rationed, the trend for kombucha died down. But more health fads brought it back to light. The hippies of the 1960s were some of the first to catch on to the idea in North America. This resurgence in popularity was given a further boost when Swiss scientists presented research confirming some of the health benefits of drinking kombucha.

Since 2007, at least seven studies have confirmed that drinking kombucha can help to combat the effects of mild exposure to radiation. It has also become popular with people going through chemotherapy as it has helped some people with the side effects of treatment.

And while it isn't actually the elixir of life or tea of immortality that our ancient ancestors claimed, it has also been shown to anecdotally benefit digestion, reduce acid reflux, reduce stress, improve skin and hair conditions, decrease colds and flus, ease arthritis pain, relieve headaches and migraines, and increase energy. It's no panacea, but many people have definitely noted benefits from consuming it.

A 2014 study on kombucha's properties showed that when a person drinks it in moderate quantities it is: detoxifying, provides protection against free-radical damage, has energizing capabilities, and increases immunity.

What makes kombucha so unique is the fact it is fermented with a pancake-like disk of yeast known as SCOBY (Symbiotic Culture of Bacteria and Yeast). However, kombucha is only mildly alcoholic. You would have to drink gallons of kombucha to ingest a comparable level to a single light beer.

The sweetened, slightly fizzy beverage is consumed cold, and it has traditionally been brewed at home. Only recently has it become available commercially. But with careful attention paid to hygiene, it's relatively easy and definitely worthwhile to tap into the ancient, easy methods and make your own kombucha!



1 Make a SCOBY

INGREDIENTS

2 cups water
1 tsp black tea*
3 tbsp white sugar*
1 cup of store-bought kombucha; pick a bottle with brown and/or clear strands, and possibly even a mini baby “jellyfish” at the bottom of the bottle. Those brownish strands will become your SCOBY.

METHOD

Boil the water then turn off the heat and add the tea and sugar, stir, and then cool it completely (you can place it in a sink filled with cold water to speed things up).

In a quart/liter glass jar, pour the strained, sweetened black tea (no leaves) and store-bought kombucha along with any brownish strands from the bottle.

Cover the jar with a paper towel or coffee filter secured with a rubber band and set it away from direct sunlight, such as in a cupboard, at room temperature (70-75 degrees Fahrenheit).

It takes 2-4 weeks to grow a SCOBY. You can look, but try not to disturb the jar as your SCOBY disk is forming on top. You won't see anything but a few bubbles in the first few days. But then a thin, translucent layer will form, eventually thickening into a full SCOBY of a ¼ inch thick. If it floats sideways or sinks, leave it! It's fine.

Keep SCOBY in its original tea until you're ready to brew your first batch. The SCOBY should live and grow for years if treated with love. The tea you used to make the SCOBY, however, is very vinegary and should be tossed. Don't use this tea as the starter to your first fermentation!

****Note**** Only use caffeinated black tea in this stage – SCOBY won't grow as well on decaf, green, or fruity teas.



Be Safe!

You must use white sugar! Honey could cause botulism bacteria, which would grow exponentially and be dangerous.

Recipe continued on page 98.

2 Starting a Batch of Kombucha Tea

INGREDIENTS

1 SCOBY
7 cups clean water
½ cup white sugar
4 bags black tea (or 1 Tbsp loose tea)
1 cup unpasteurized, unflavored, store-bought kombucha or starter tea from an old batch of kombucha

METHOD

This will make a Half-Gallon (1.8 Liter) of Kombucha Tea. Bring water to a boil in a clean pot. Remove from heat and dissolve sugar into it. Add the tea and allow it to steep while the water cools to room temperature (a few hours). It must be room temperature. Don't risk killing your SCOBY in hot water.

With hands AS CLEAN AS A SURGEON'S (really clean), gently remove your SCOBY from the tea and place on an equally clean plate. You can rinse out the jar if you want (without soap), but it's not necessary.

Pour the sweetened tea into your ½ gallon (1.8 L) glass jar(s), then pour in starter kombucha (if you're using two jars, pour ½ of the starter kombucha into each).

Gently place SCOBY into the jar then cover with a few layers of the tightly woven cloth, or paper towel, or a coffee filter or two, and secure the covering with a rubber band.

Set the jar(s) somewhere dark, still, and at room temperature for anywhere from 6 to 10 days. Begin tasting the tea at about 6 days by gently drawing out some of the tea with a straw. It should be mildly sweet and slightly vinegary. The warmer the air temperature, the faster the kombucha will ferment. The longer the tea ferments, the more sugar molecules will be eaten up, the less sweet it will be.



Reserve 1-2 cups from this batch to use as starter kombucha for your next batch (just leave it in the jar with SCOBY(s)). The rest can move into the second fermentation.

****Note*** In this step, unlike in the making of the SCOBY, you can use other teas besides black. Feel free to experiment with green, white, oolong, or combinations of them. But fruit teas should be mixed with a few black tea bags to ensure the SCOBY gets what it needs to thrive. You can also use a metal tea ball with loose leaf tea, just keep it out of contact with the SCOBY.*

Once the SCOBY gets to be about an inch thick, peel off a few layers to create a second SCOBY (you can share the love and gift this to a friend!) Not sure if your Kombucha is brewing right? It should lighten in color, develop a "Kombucha smell", and show SCOBY and yeast growth.

Be Safe!

If at any point in the process you suspect something has gone wrong (such as black or green mold spots or a cheesy or rancid smell), toss the whole batch and start a new one.

3

Making Carbonated Kombucha Tea

INGREDIENTS

Homemade kombucha tea from the first fermentation
2-4 tsp sweetener (fruit, honey, or sugar) per 3-4 cups of kombucha
Flavoring: per 3-4 cups of kombucha, you may want to add one or a combination of the following:
¼ cup mashed fruit or fruit juice (blueberries, strawberries, peaches, apples), a slice of orange or lemon zest, 1/2" fresh ginger, grated, 2-3 whole cloves, 1/2" crushed cinnamon stick

METHOD

Strain kombucha and funnel it into fermenting bottles or canning jars, leaving about 1 ½ inches free at the top.

Add your chosen sweetener and flavoring(s) and seal the lid.

Let the kombucha ferment somewhere dark and at room temperature for 1-3 days.

If desired, strain out fruit before serving.

Place the bottles in the fridge to slow the carbonation process.

Carefully open bottles over the sink with a towel in hand.

The more sugar/fruit you add, the faster the kombucha will ferment and become carbonated. ■



Be Safe!

Your jars can explode if the pressure becomes too high! For your first few batches while you're still getting the hang of how kombucha reacts to your environment, bottle a portion of it in a plastic bottle. This will act as a gauge for how the others are doing. When the plastic bottle is rock solid, the rest are probably done. "Burp" them by opening each to release some pressure, then place them in the refrigerator to slow fermentation.



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